REFERENCE 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE. SUITE 1200
DALLAS. TEXAS 75202-2733

7 February 1996

URGENT LEGAL MATTER - PROMPT REPLY NECESSARY

CERTIFIED MAIL/RETURN RECEIPT REQUESTED - Z 348 084 297

EPA I.D. NO.: LAD058475419

ATTN: Mr. Lynn Dean
No. 1 Dean Street
Braithwaite, Louisiana 70040

RE: EPA Expanded Site Inspection
Site Access Request
Delta Shipyard, Houma, Louisiana

Dear Mr. Dean:

The purpose of this letter is to request you to voluntarily permit the U.S. Environmental Protection Agency (EPA), and its officers, employees or representatives, authorized by EPA, including but not limited to Roy F. Weston, Inc. (WESTON®), (Contract No. 68-W9-0015), access to the above referenced property located at 201 Industrial Boulevard in Houma, Louisiana so that EPA can enforce the provisions of the Comprehensive Environmental Responsibility Compensation and Liability Act (CERCLA), as amended, 42 U.S.C. § 9601 et seq., copy pertinent documents or records, inspect the site, and obtain samples of any suspected hazardous substance or pollutant or contaminant found on site. A description of the property or a map identifying the site for which access is required is attached.

Specifically, WESTON has been requested by the EPA, Region 6 to conduct an Expanded Site Inspection of the Delta Shipyard Site to further assess the degree of risk to the public health, welfare, and environment related to hazardous substances, pollutants or contaminants that may be present at the site. Based on preliminary file information, EPA finds it necessary to perform this Expanded Site Inspection at your site pursuant to 40 CFR 300.400 Subpart E.

Section 104(e) of CERCLA, 42 U.S.C. Section 9604(e), explicitly grants EPA the authority to enter a property at reasonable times to inspect and obtain samples from any location of any suspected hazardous substance or pollutant or contaminant. Further, the cited section authorizes EPA to require any person who has or may have information relating to any of the following to furnish information or documents relating to:

1. The identification, nature and quantity of materials which have been or are generated, treated, stored, or disposed of at vessel or facility, or transported to a vessel or facility;
2. The nature or extent of a release of a hazardous substance, or pollutant, or contaminant at or from a vessel or facility;
3. Information relating to the ability of a person to pay for or perform a cleanup.

It is EPA policy to seek voluntary cooperation from the public when possible. Consequently, EPA is making this request for access to the property and records mentioned above. EPA hopes that you will voluntarily comply by signing, dating and returning the enclosed Consent for Access to Property, to the address indicated below within seven days of your receipt of this letter. Please mail it to:

Eddie Sierra
Superfund Site Assessment (6SF-RA)
USEPA Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

If EPA does not receive the enclosed consent for access to the property, signed and dated by you, EPA will treat your failure to respond as a denial of access. Please note that EPA will not agree to conditions which will restrict or impede the manner or extent of an inspection or response action, impose indemnity or compensatory obligations on EPA, or operate as a release of liability. Should you impose conditions of this nature in the consent for access to the property, EPA will treat this as a denial of consent.

Failure to grant EPA access may result in the issuance of an order directing compliance with EPA's request for access. Failure to comply with such an order may result in a civil action in United States District Court to enjoin compliance with the order. EPA may also seek the assessment of a civil penalty not to exceed $25,000 per day of noncompliance with the order. You may assert a business confidentiality claim covering part of the information you submit in response to this request. Any such claim must be made by placing on (or attaching to) the information, at the time it is submitted to EPA, a cover sheet or a stamped or typed legend or other suitable form of notice employing language such as "trade secret," "proprietary," or "company confidential." Confidential portions of otherwise nonconfidential documents should be clearly identified and may be submitted separately to facilitate identification and handling by EPA. If you make such claim, the information by that claim will be disclosed by EPA only to the extent, and by the means of the procedures, set forth in Subpart B of 40 CFR Part 2. If no such claim accompanies the information when it is received by EPA, it may be made available to the public without further notice to you. The requirements of 40 CFR Part 2 regarding business confidentiality claims were published in the Federal Register on September 1, 1976, and amended on September 8, 1978, and December 18, 1985.

As part of the information gathering process, the collection of samples from your site may become necessary. This collection process may generate investigation derived wastes (IDWs) such as equipment, rinsate water, or disposable personal protective clothing. WESTON will manage these IDWs in the most responsible manner consistent with EPA policy regarding these wastes, which is to leave site conditions essentially unchanged, such as to return soil cuttings to the location from which they were taken or properly to dispose of the IDWs.

Field inspection activities are tentatively planned for May 1996 through June 1996. You will be given at least two (2) weeks notice prior to the site visit. Eric Tate will be contacting you to verify the exact dates of this visit. During the visit you will be provided with a receipt describing any samples obtained and, if you so request, you will be given a portion of each sample. There will be no charge for the samples EPA provides you. If you would like a portion of each sample, please put a check mark in the space provided in the enclosed consent for access to property. If you do not wish to be provided with a portion of each sample, please put a check mark in the alternative space. If you do not mark any space, EPA will treat your failure to respond as your statement that you do not wish to be provided with a portion of each sample.

You can obtain a copy of the resulting inspection report and analytical data by writing to Ed Sierra, Chief, Superfund Site Assessment Section (6SF-RA), EPA Region 6, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202-2733.

In future inquiries, please indicate your site's EPA I.D. Number and name as listed, to ensure prompt processing. If you have any questions concerning this matter, please contact me at (214) 665-6740.

Sincerely,

Eddie Sierra
Superfund Site Assessment
EPA Region 6

cc: Tim Knight
LDEQ - Inactive and Abandoned Sites Division
P. O. Box 82282
Baton Rouge, LA 70884-2282

bcc: D. Gray (6X)
V. McFarland (6SF-P)
M. Peycke (6SF-DL)

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P. O. Box 82282
Baton Rouge, LA 70884-2282

arcs:46032631:dean.126(lcd)

Z 348 084 297

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to Mr. Lynn Dean	
Street and No. No. 1 Dean Street	
P.O., State and ZIP Code Braithwaite, La. 70040	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, March 1988

CERTIFIED

Z 348 084 297

MAIL

TRANSMITTAL LETTER

WESTON
MANAGERS DESIGNERS CONSULTANTS

5599 San Felipe
Suite 700
Houston, Texas 77056
Phone: 713/621-1620
Fax: 713/621-6959

TO: US EPA Region VI
1445 Ross Avenue
Dallas, TX 75202

ATTN: Don Markham

CLIENT / PROJECT: Van Waters & Rogers
Delta Shipyard

RE: Site Access

WORK ORDER NO: 4603-023-027-1400
4603-026-031-0100

DATE: 1·30·96

WE TRANSMIT THE FOLLOWING:

- ☒ Letter
- ☐ Report
- ☐ Calculations
- ☐ Per Your Request
- ☐ Memo
- ☐ Dwgs/Specs
- ☐ Product Literature
- ☐ RFW Literature
- ☐ Other

ITEM NO.	NO. COPIES	DESCRIPTION	ACTION CODE
1	1	Site Access Letter to Mr. Lynn Dean LAD058475419 (Delta Shipyard)	A
2	1	Site Access Letter to Mr. Bert Hanna ARD000709253 (VW & Rogers)	A

ACTION CODE:
A - For Your Information
B - For Your Approval
C - For Your Review and Comment
D - For Your Files
E - Reply Requested
F - Other

REMARKS: Enclosed are the site access agreement letters to Mr Lynn Dean & Mr. Bert Hanna for Delta Shipyard and Van Waters and Rogers respectively. Please forward these on to the listed land owners. For your information, the Van Waters and Rogers' site is currently owned by Bert Hanna of Hanna Potpourri Specialties.

COPIES TO: Eric Tate (Hou)
Jeff Wormser (Hou)
Robert Beck (STX)
Diane Williams (Hou)

SIGNED: Grayson Pointer
Grayson Pointer
(Printed or Typed Name)

~~88483~~

CONSENT FOR ACCESS TO PROPERTY

Name:	Lynn Dean	EPA I.D. No.:	LAD058475419
		Site Name:	Delta Shipyard, Houma, Louisiana

Description of Property: The Delta Shipyard is located at 201 Industrial Boulevard in Houma, Louisiana (see attached site location map).

I hereby consent to officers, employees, and representatives authorized by the United States Environmental Protection Agency (EPA) entering and having continued access to my property for the following purposes:

1. Reviewing and copying documents related to the site;
2. The taking of such soil, water and air samples as may be determined to be necessary;
3. The sampling of any solids or liquids stored or disposed of on property;
4. The drilling of holes and the installation of monitoring wells for subsurface investigation of subsurface contamination.

I realize that these actions are undertaken pursuant to EPA's response and enforcement responsibilities under the Comprehensive Environmental Responsibility, Compensation, and Liability Act, as amended (CERCLA), 42 U.S.C. § 9601 et seq., as well as 40 CFR Part 300.400 Subpart E.

I am the property owner, or a responsible agent of the property owner, and I warrant that I have the authority to enter into this access agreement.

Place a check mark in the appropriate space. Please note that if no selection is made EPA will assume that you do not wish to be provided with a portion of the sample.

(✓) Please provide me with a portion of each sample taken at the property described above. I also understand that there will be no charge for the sample portions provided by the EPA. I also understand that I must furnish suitable containers, be responsible for the laboratory analytical analysis, and sign for the transfer of custody from the EPA designated sampler.

( ) I do not wish to receive a portion of samples taken at the property described above.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

2/13/96
DATE

[signature], MANAGER
SIGNATURE, Title FOR LYNN DEAN
KEN SERIGNE

~~88486~~

CONSENT FOR ACCESS TO PROPERTY

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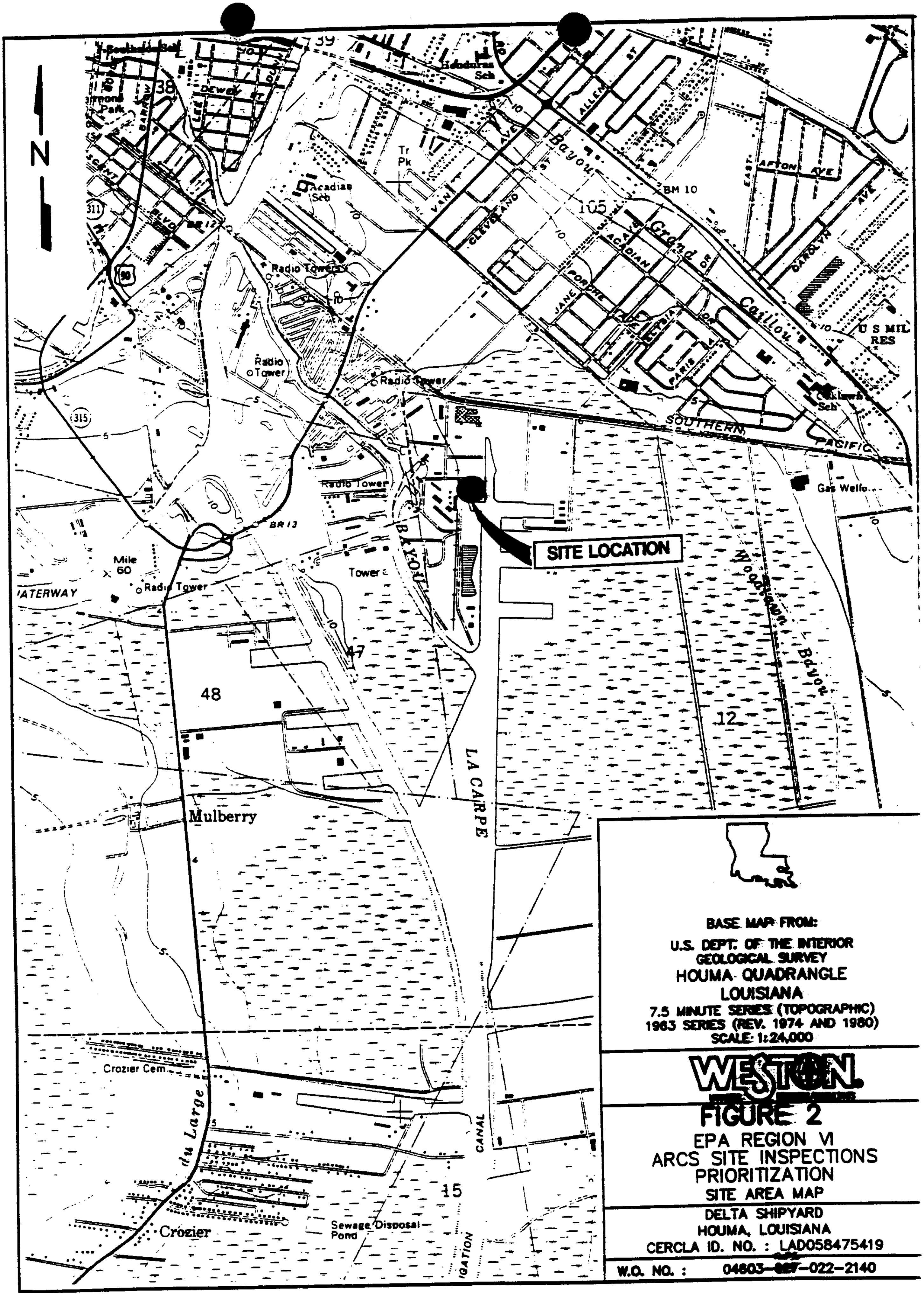
This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

__________ DATE

__________ SIGNATURE, Title



BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
HOUMA QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1963 SERIES (REV. 1974 AND 1980)
SCALE 1:24,000

WESTON

FIGURE 2
EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
SITE AREA MAP

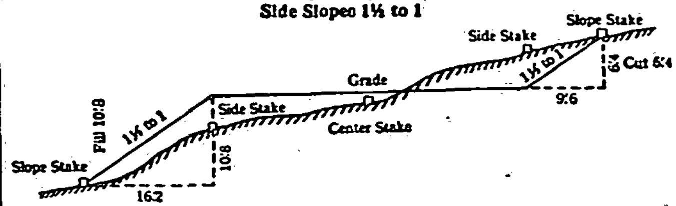
DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-~~027~~-022-2140

REFERENCE 4

~~88487~~

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING
Roadway of any Width
Side Slopes 1½ to 1



In the figure above: Opposite 6 under "Cut or Fill" and under .4 read 9.6 the distance from the side stake to the slope stake at right. Opposite 10 under "Cut or Fill" and under .8 read 16.2, the distance from the side stake to the slope stake at the left.

Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

If found, please return (postage guaranteed) to:

Property of Roy F. Weston, Inc

Address 5599 San Felipe, Suite 700
Houston, TX 77056

Phone (713) 621-1620

This Field Book contains special paper which is impregnated with resin to make it substantially stronger as well as water resistant. Your field notes will come out sharp and clear even when the page is wet.

INDEX PAGE

JOB NO.	PROJECT	PAGE NUMBER

3/7/96 Delta Shipyard Eric Tate 1

7[15] a.m. This logbook will be used to document field activities for the Delta Shipyard Expanded Site Inspection W.O. # 04603-026-031

WESTON will perform a site reconnaissance today. Field team members ~~are~~ are Eric Tate (ECT) and Joy Ishigo (JLI)

ECT successfully calibrates the OVA to 93ppm methane.

10[00] Drive Hospital route, arrive at site.

10[05] Meet with Ka Serigne, of Elevated Boats Inc. Plant Manager

Look @ some maps of the site. Mr. Serigne gave us one to look at.

Houma Navigational Canal (HNC) & Bayou La Carpe primarily a used for ships & industry. No residences south of site. Maybe an occasional fisherman along the HNC, but really not used for recreation, mostly industry.

2 3/7/96 Delta Shipyard ECT

Cocodrie area, south of site heavily used for recreational fishing, about 30 miles downstream.

Houma : mainly oil related industries, some manufacturing

EBI: fabricates & operate off-shore lift boats, manufacture cranes for offshore platforms & boats.

Mr. Dean, site owner, purchased the property in 1986. EBI came in around 1990.

10[35] Mr. Serigne identifies fences & property boundaries on map

EBI has 30 employees at this location. Other tenants much smaller

10[46] Luke Dean meets with us. Will escort us thru site

Tanks (2) One has sludge in it from before EBI moved in. Mr. Serigne not aware of other waste sources.

3/7/96 Delta Shipyard ECT 3

10[55] Begin walk-through
OVA reading 0.0, Action level = 46 units
Mini RAM calibrated, reading zero
action level = 2.5

Trailer located near parking lot (former pits)
Two friends of Mr. Dean stay there

11[05] Drive to pits. First look at Pit 2
East side of pit has a 4-5 ft high berm ~~Further south, berm lessens to~~ ECT. Pit 2 consists of two cells. Both measure 140' east-west. N-S unknown. Too difficult to physically measure.

Pits 2 & 3 are separated by the same height berm. The material (sludge) in the pits is about 2 feet below berm. Berm is intact except for an outlet ~~to~~ to the drainage ditch near the N-S midpoint of Pit 2.

Pits 2 & 3 consist of crusty brown material near edges & sludge w/ standing water in the middle. Will obtain aerial photographs to estimate areas. Water has an oily sheen. Hydrocarbon odors, but nothing picked

3/7/96 Delta Shipyard ECT

up on OVA. Weather is cold (50°F) and breezy. Partly cloudy, very humid.

Pit 1 is much smaller than Pits 2-3. It is covered by about 2 feet of soil in most places or vegetation. No standing water, but ground surface is spongy.

Pit 4 appears as an open field. Ground surface solid with thick grass cover. It's not easy to determine the pit boundaries.

On the south side of Pit 3, the drainage ditch turns east & runs to near the Houma Navigational Canal. A pipe apparently connects the ditch to the Canal. This is the PPE, but access is difficult.

For sampling, it'll be easier to reach the PPE by going thru the property just south of Pit 3. It's owned by Mr. Dean, but leased to Salvage & Associates. Manager: Eddie Thibodeaux. (504) 873-7037.

3/7/96 Delta Shipyard ECT

Access to the pits is unrestricted. Evidence of casual trespassers?? -- beer bottles, cans, etc along banks of Pits 1-3.

Fumes or odors especially noticeable near Pit 3. No OVA response, maybe due to weather conditions??

Pit 4, based on the map Mr. Serigne, might extend further south than indicated on previous Weston site maps. The field (Pit 4) is relatively flat with no obvious drainage pathways

1335 Return to EBI Parking lot. Observe AST. Reads 22,800 gallons on side. Contains sludge from historical Delta Shipyard Activities

1415 Conclude site recon. Depart site

Eric Tate

6/27/96 Delta Shipyard 4603-26-31 ECT

8³⁰ Arrive at Houma Water Treatment Plant Weston team members Eric Tate (ECT) & Reed Woodcox (RKW)

meet at water plant on Intracoastal Waterway. After intakes, treatment w/potassium permanganate for taste & odor, (2) Aluminum sulfate as a coagulant, then (3) activated carbon (granular)

Locations at main intake + Bayou Black backup station both easily accessible by boat & foot.

9:15 Go to tanker shop, pickup supplies. Drive hospital route

9:50 Arrive at site. Hold H2S briefing. Calibrate OVA (RKW) to 93.1 ppm methane. Meet w/ Kevin Serigne, acting plant manager

Go to southern edge of site along Salvage Associates property. With a video camera, RKW shoots PPE & water. Background OVA reading = 2.9 units.

6/27/96 Delta Shipyard 4603-26-31 ECT

Move to pit 2. Push a 1"x1" x 7 foot wood rod. Penetrates ~~to~~ 6.5 feet. Water near overflow pipe depth of 2 feet. OVA @ 2.5 units.

Move to pit 1. OVA broken, but hydrocarbon odor. Try to work fast & rely on previous OVA readings. Depth of pit = 6.5 feet, 20 feet from western edge. Sludge begin at a depth of approximately 6 inches.

Move to pit 3. Prominent hydrocarbon. Shoot video for ≈ 1 min & get out. RKW mentions odor like creosote/naphthalene. No depth reading

1120. Depart site

Eric Tate

7/22/96 Delta Shipyard 4603-26-31 ECT

0700 Arrive @ boat launch. Weston team members Dennis Hayes (DFH), Troy Hile (TDH), and Eric Tate (ECT). Meet with Sam LeBeouf of the Louisiana Universities Marine Consortium (LUMCon) who will drive the boat. Held H&S briefing. Begin loading gear onto boat. Visqueen is laid out near winch (sampling area) & will serve as an exclusion zone for Sam. DFH calibrates OVA to 99.0 ppm methane.

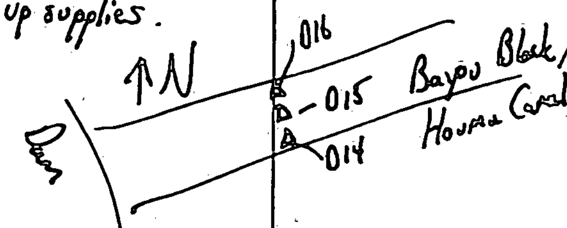
At each sample location for stream sediments, the samples will be collected as follows. Using the winch, DFH will lower the dredge sampler to the bottom & collect the sample & measure the depth. The sample will then be brought to the surface & the VOC sample collected. The remaining sample will be mixed in a stainless steel bowl & screened with an OVA. The remaining samples will then be collected. DFH will then decon the mixing bowl & sampler... ECT will take notes & mark sample locations with a hand-held GPS. TDH will label, tag & bag samples before placing them in a cooler filled with ice.

7/22/96 Delta Shipyard 4603-26-31 ECT

0915 Set up to collect 014-51-1 in Bayou Black. GPS filename = SØ72214A. Depth = 2'10". Sample collected approx. 20 ft. from west bank. OVA = 10 units. Breathing zone = Ø. Sediment is dark gray w/ slight oily sheen.

0940 Move to middle of channel to collect sediment 015-51-1. Depth = 7'6". OVA >1000

1005 Go to eastern bank. Depth = 7'6". Set up to collect sediment sample 016-51-1. OVA >1000. Weather is about 90°F, partly cloudy & very humid. Return to dock to pick up supplies.

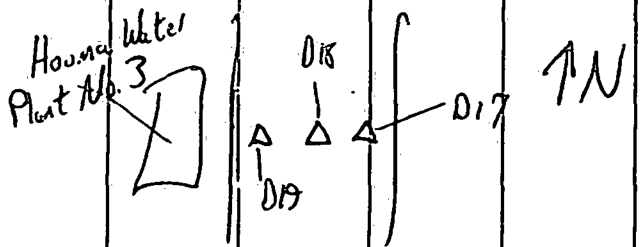


PIC 1 looking upstream from 017

1100 Set up @ 017-51-1 sediment sample near intake for water plant #3. Collect approx. 50 feet from eastern bank. OVA >1000. Depth: 11'6"

7/22/96 Delta Shipyard 4603-26-31 ECT

1130 Move to center of channel: Intracoastal Waterway. Collect sediment sample D18-51-1. Depth: 19'1". Sample time = 1140. OVA = 10 units.

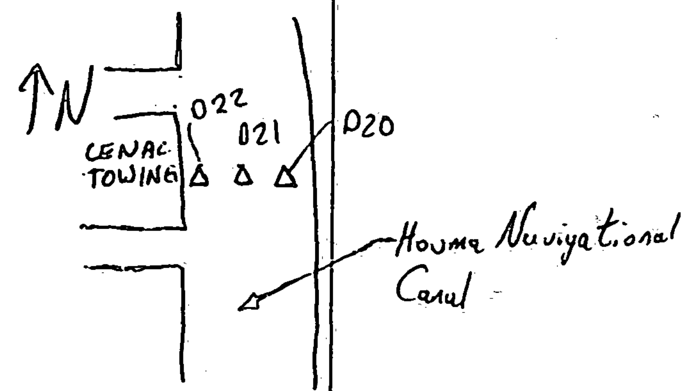


1200 Set up @ D19-51-1 for a sediment sample. Depth: 12'11". Collect sediment sample @ 1200. OVA reading is >1,000 units.

1300 Set up a sediment sample location D20-51-1. Depth = 7'0" approx 40 feet from east bank of Houma Navigational Canal. OVA = 100 units. PIC 2 looking upstream from D21.

1310 Set up @ D21-51-1. Depth = 19'10". OVA = 400 units

7/22/96 Delta Shipyard 4603-26-31 ECT



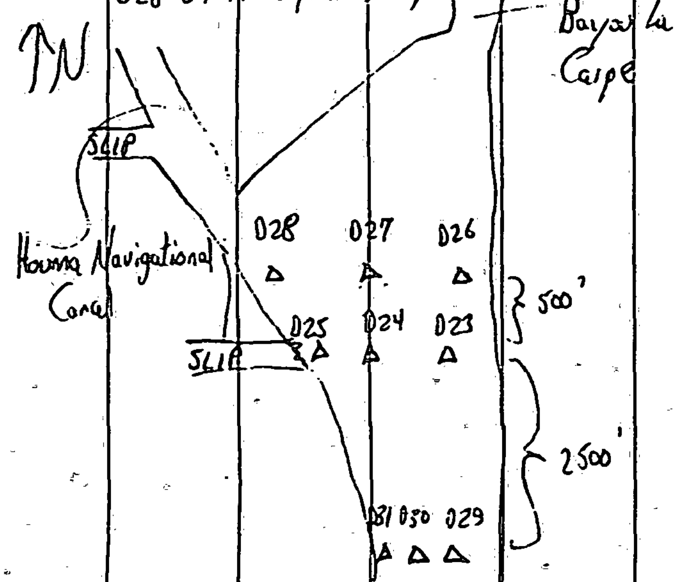
1320 Move & collect sample D22-51-1 from western bank. OVA >1000. Depth = 14.5 ft. Experiencing GPS difficulties. After call to Westchester (Steve Broadman), will delete file & recapture. Under file S072218D, stations D20-22 @ 1350 hours.

1405 Head south to confluence of Bayou La Carpe & Houma Canal. Set up to collect D26-51-1 approx 75 feet from east bank. Depth = 2'4". Open new GPS file S072219A. OVA = 900 units

1425 Move to middle of channel, to collect D27-51-1. Depth: 8'10", OVA: 100 units.

7/22/96 Delta Shipyard 4603-26-31 ECT

1440 Go to western bank to collect sediment sample D28-51-1. Depth = 9'0", OVA = 400 units.



Open new GPS rover file SØ72219B.

1500 Set up @ sample station D23. Depth = 3'4" Approximately 75 feet from east bank. OVA >1000 units

1515 Move to center of channel to collect sediment sample D24-51-1. Depth = 9'9", OVA >1000. Crab cages noted near D26.

7/22/96 Delta Shipyard 4603-26-31 ECT

1530 At western bank, begin collecting D25-51-1. Depth = 17'9", OVA >1000. Each sample collected from the Houma Navigational Canal thus far has been grayish-brown in color. Close GPS file. Open new rover file SØ72220A

1540 Move about 2500' south & set up @ station D29, approx 75 from east bank. Depth = 8.0 ft. OVA >1000 units.

1555 Middle of channel. Depth = 21'8" for station D30. OVA >1000. Sample @ 1600

1605 West bank at ≈ 75 feet for sample station D31. Depth = 12'3", OVA >1000, Head back to dock to unload gear & pack samples

1900 Finished packing samples & changing flat tire on Explorer. Depart for Fedex. Drop samples off & return to ~~site~~ boat launch to load all gear.

1930 Depart boat launch.

Eric Tate

7/23/96 Delta Shipyard 4603-26-31 ECT

0700 Arrive at boat launch, Weston team members ECT, DFH, & TDH. Met by Sam LeBoeuf of LUMCon, who has brought a larger boat today. Begin loading gear onto boat. Once again, an exclusion zone is set up by laying visqueen in the front of the boat. DFH calibrates the OVA to 93.1 ppm methane.

0810 Set off from boat launch. Attempt to collect 033, but apparently Bayou LaCarpe doesn't exist north of the Intracoastal Canal (GIWW). So proceed up the GIWW to station 032

0830 Team members will have same responsibilities as 7/22/96. Collect sample 032-51-1. Depth is 18'3", OVA = 0
Open new GPS Rover File S072313A.
Flow in GIWW is to the northeast today.
Mr. LeBoeuf says he knows of GIWW tidal influence as far north as New Orleans West Bank area. Sediment = grayish brown fine sandy clay. Leave & decide to still take 033. Weather: 90°F, humid, partly cloudy.

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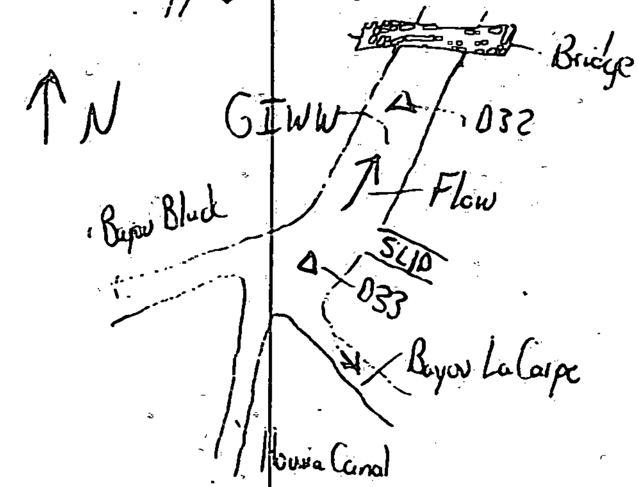

0930 Set up to collect sample 033-51-1. Depth = 18'2". Will take photos here to document sediment sample collection protocol. OVA reads 400 units. Collect sample @ 0950.

1030 Maneuver to station 005 at the PPE to the surface water pathway. Depth = 1'9". Open new GPS Rover file S072315A. Call Ken Serigne of EBI to set up site recon for later today. OVA = 300 units. Collect 005-51-1 @ 1030. Also collect duplicate sample 005-52-1 @ time 1050. Release anchor and move to middle of the channel

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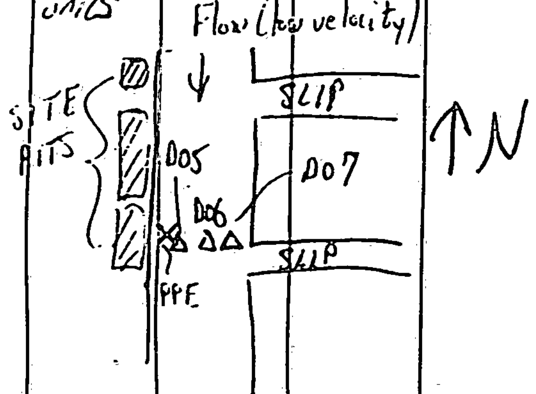
1115 Move to middle of channel for sample D006-51-1. Depth = 13'5", OVA > 1000 units

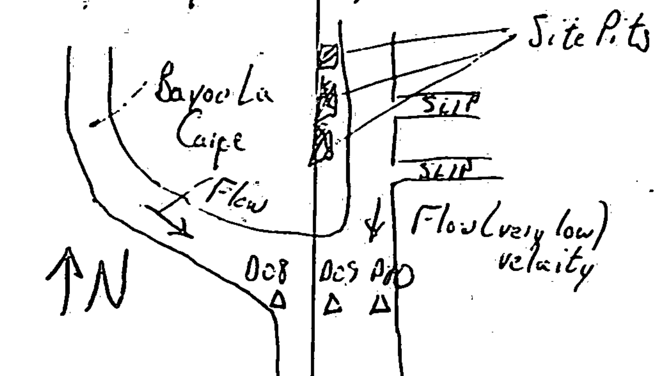


1130 At east bank, collect sediment sample D007-51-1. OVA = 200 units, depth is 2'2". Head back to boat launch for supplies. 3 Pics take of west bank.

1230 Collect rinsate blank 007-43-1 from the stainless steel mixing bowl used for sediment sampling. ECT sets up visit to Houma Water Plant for 7/24 (tomorrow). Depart launch to collect remainder of sediment samples. ~~Head~~

7/23/96 Delta Shipyard 4603-26-31 ECT

1245 Set up @ station D08 to collect a sediment sample. Depth = 5'2", OVA > 1000 units



Set up new GPS Rover File SØ72317A
Move to middle of stream confluence

1300 Collect sample D09-51-1. Depth = 11'4"
OVA > 1000 units

1315 Set up @ sample station D10. Depth = 2'2"
OVA = 70 units. Head north in Bayou La Carpe

1330 Set anchor @ east bank of Bayou La Carpe, approx. 1000 ft. south of bridge @ sample station D11. Depth = 11'0", OVA = 60 units

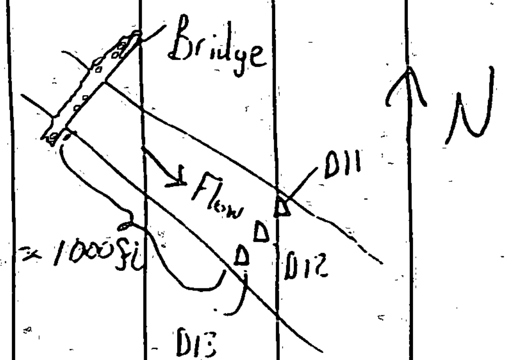
1410 Collect rinsate blank 011-43-1 off of dredge

7/23/96 Delta Shipyard 4603-26-31 ECT

ponar sampler. Move to middle of channel.

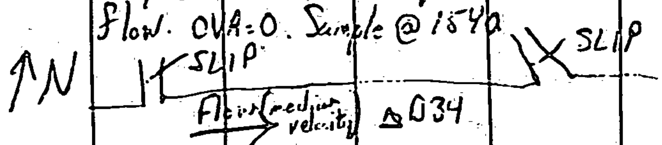
1430 Drop ~~sample~~ dredge to collect sediment sample D12-S1-1. Depth = 12'7". OVA = 400 units

1450 At western bank, collect sediment sample D13-S1-1. Depth = 2'9", OVA = 100 units



Move out & head to intracoastal waterway.

1530 Set up @ station D34. Depth = 21'6". East flow. OVA = 0. Sample @ 1540



Call Geo Environmental to set up for tomorrow

7/23/96 Delta Shipyard 4603-26-31 ECT

1600 Return to launch pad, unload gear. Rain clouds moving our way. Rain starts so begin paperwork in back of truck.

1900 Sample packing complete. Depart boat launch & drop samples at Fedex.

7/24/96 Delta Shipyard 4603-26-31 ECT

0800 Arrive at site. Weston team members, ECT, DFH, TDH, and Jay Ishiyo (JZI). Meet with Ken Serigue of Elevated Boats, Inc. (EBI). Weston drilling subcontractor (geoprobe) Geo Environmental is represented by Roger Miller. Gary Chisson of EBT goes to area between the water and the eastern pit berms & carves out a road for us using a bulldozer. Hold H&S meeting & return to Ryder truck to load gear.

0915 At this point, the Weston sample team will split up. ECT & TDH will go to boat launch to meet Sam LeBoeuf to collect additional GPS data. Afterwards, water samples will be collected. DFH & JZI will go with the geoprobe & drill 2 shallow borings for collection of water samples, and if time permits, collect some drainage ditch sediment samples. DFH will take notes to be later transcribed.

1045 Go to boat launch & depart
Open GPS Rover file S072415A
Lock in 014-16. Head to new Houma Water Plant to lock in 017-019

7/24/96 Delta Shipyard 4603-26-31 ECT

1145 Head south to recapture 020-022. Measure 020 before rain sets in: GPS not acquiring satellites.

1315 GPS unable to lock in on 021 or 022. Decide to abandon. Heavy rain setting in. Call Robert Beck. Decide to go past 15 feet if possible to document depth of contamination near pits. Return to site to inform DFH. Now very heavy rain & lightning.

1300 Depart site to collect water samples.

1345 ECT collects W01-11-1 at the drinking water intake along Bayou Black.
Sample jar Lot # 0200201H

1415 ECT collects W03-~~5t~~ 11-1 (ECT)
from clear well (post treatment)
at the Houma Water
Treatment Plant
Sample jar lot ~~#~~ 0100201H

7/24/96 Delta Shipyard 4603-26-31 ECT TH

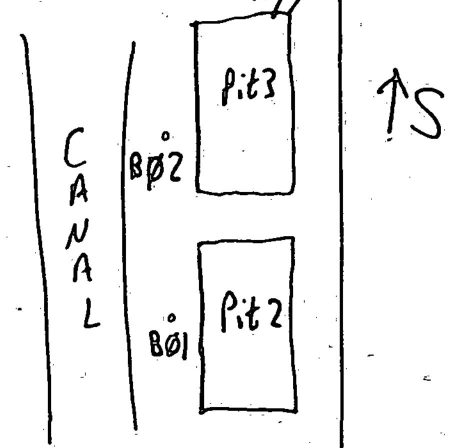
1430 ECT collects W02-~~51~~ 11-1 at the surface water intake along the Intracoastal Waterway. Sample jar lot # 0200201H and 0100201H. Organics were doubled.

1450 ECT collects W02-12-1, which is the duplicate sample of W02-11-1, at the surface water intake along the Intracoastal Waterway. Sample jar lot # 0200201H.

1500 Return to site. Collection of water sample from boring 1 (17ft) being completed. B01-21-1 is the MS/MSD sample. Begin paperwork and DFH begins second boring w/ driller.

1630 Complete second boring to 24 ft. OVA hits at base of both holes. First boring has oily sheen. Collect 3 soils from each boring to send to high concentration lab. Due to rain driller's truck stuck. Tow out w/ RFW Explorer so driller can prepare grout

7/24/96 Delta Shipyard 4603-26-31 ECT



1800 Each hole is tremmie grouted from the bottom up. TDH departs for ice & 2 coolers to FedEx.

2000 Complete paperwork & sample packing, but Ryder truck stuck in mud. After 10-15, we manage to get the Explorer out & head to Fedex

2100 Approx 5 miles, from Fedex, which closes @ 2100. Decide to turn around, missed FedEx.

2300 Return to hotel. Open sample coolers (3) and remove vermiculite. Fill voids with ice to preserve samples.

0815 Arrive at site. Weston team members ECT, DFH, RDH, & JLI. Speak w/ Ken Serigne, arrange to have a bulldozer push our truck out.

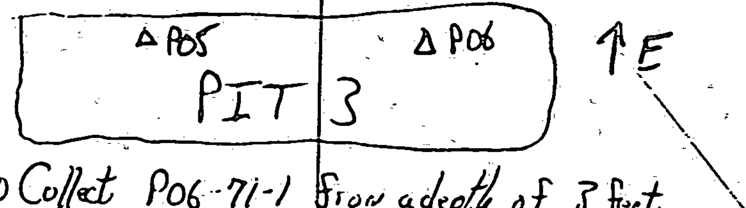
0900 Set up near pit 2 on road & construct a decon pad. Collect rinsate blank P09-48-1 from auger buckets. ECT calls Robert Beck (RFW) & Christy Macdowell (EPA) to inform them about our missed Fedex drop. Christy says to ice samples (already done) & ship tonight. ECT calibrates OVA to 99.0 ppm methane. Hold H_2S briefing

1015 Using a machete, cut a path to pit 3 from Shell Road. OVA readings fluctuating. Decide to upgrade to Level C. Return to command post, inspect masks. Insert GMC-H cartridges. Check positive & negative pressure. Will use respirators for all pit samples.

1045 Set up @ sample station P05. Using an auger with extensions, collect sludge sample

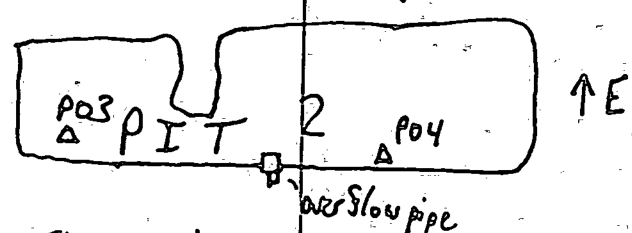
from an approximate depth of 3 feet. Screening with OVA reveals 700 units. Collect P05-71-1 @ 1100. Collect duplicate P05-72-1 @ 1120. Back to truck. Drop off samples. Refill OVA.

1140 Cut path to sample station P06



1200 Collect P06-71-1 from a depth of 3 feet. OVA screening = 900 units. Return to truck.

1230 Set up to collect sample P04-71-1 from south half of pit 2. OVA screening = 900 units

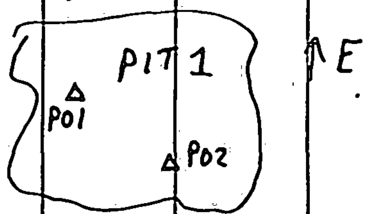


Take water break

1315 Collect sample P03-71-1 from north end of pit 2. OVA screening > 1000 units

Return to command post. OFH decons auger buckets. ECT scouts pit 1 sample locations ROH + JLI assist in decon. ECT unloads trash

1430 Decon complete. Head to pit 1 + collect sample P02-71-1 from an approximate depth of 3 feet. OVA screening = 500 units



1500 Collect sample P01-71-1 from a depth of 3 feet. OVA screening > 1000 units. All of the pit samples collected today appeared dark brown + very oily sludge.

1515 Return to command post + begin packing samples. Rain moving in. Decon augers.

1845 Sample packing + chain-of-custody forms complete for shipment to CLP labs, DV lab, + Weston EMI (sludge samples). Dispose of decon water in pit 2. Depart site for Fedex

0730 Arrive at site + check-in with Ken Serigne. Weston team members ECT, JLI, OFH, + TDH. Set up command post + prepare to collect drainage ditch sediment samples. OFH calibrates OVA to 99.0 ppm methane.

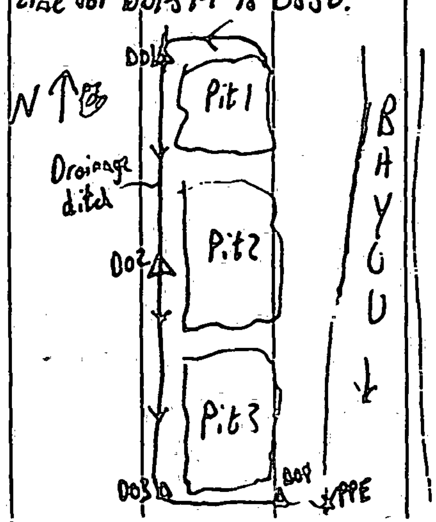
0800 Near pit 02 overflow pipe, collect sediment sample D02-51-1 from the middle of the drainage ditch. Slight sheen on water, but appear biologically related. OVA screening = 10. Sediment is light brown. The width of the ditch is approximately 3 feet with about 8 inches depth of water. Also collect duplicate sample D02-52-1 at this station and assign it sample time 0815.

0820 Set up @ D03 near Salvage Associates. Met with Eddie Thibodaux, owner, for site access to get to sample station D04. Mr. Thibodaux indicated he's been here since 1991 and he's never seen an oily sheen in the ditch. Collect D03-51-1 @ 0820. Also collect duplicate sample D03-52-1 + label it as sample time 0830. OVA screening = 0. Depth of water appox 8-12 inches + ditch thickness about 8 feet. Call CLASS for saturday lab pickup

7/26/96 Delta Shipyard 4603-26-31 ECT

0830 Set up @ D04 near PPE. Area is heavily vegetated. Water depth is approximately 6 inches, channel depthickness about 6 feet. Sample D04-S1-1 is approximately 30 feet west of the PPE. Sample time is 0840. Return to truck & drop off samples to TLI.

0845 Go to northernmost accessible ~~D~~ drainage ditch location to collect background sample D01-S1-1. Water depth = 1 foot, channel width ≈ 15 feet. Water has an oily sheen, sediment is ~~blac~~ stained black & has a hydrocarbon odor. OVA = 450 units on sample screening. There appears to be no suitable background location in the ditch. Sample time for D01-S1-1 is 0850.



7/26/96 Delta Shipyard 4603-26-31 ECT

0900 Return to command post to begin packing samples. Clean up truck.

0945 Depart site for FedEx.

(1.1) 30

8/7/96 Della Shipyard JLT

STATION NO.: D01-51-1
ORGANIC CLP#: FFE 73
TAG #: 6-012801-03
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY 33
TAG #: 6-012804
LOT #:
TIME: 0850
DATE: 7/26/96

STATION NO.: D02-51-1
ORGANIC CLP#: FFE 73
TAG #: 6-012805-07
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY 34
TAG #: ~~6-012804~~ 6-012808
LOT #:
TIME: ~~MFG~~ 0800
DATE: 7/26/96

8/7/96 Della Shipyard 4603-26-31 JLT

STATION NO.: D02-52-1
ORGANIC CLP#: FFE 75
TAG #: 6-012809-11
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY 35
TAG #: 6-012812
LOT #:
TIME: 0815
DATE: 7/26/96

STATION NO.: D03-51-1
ORGANIC CLP#: FFE 76
TAG #: 6-012813-15
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY 36.
TAG #: 6-012816
LOT #:
TIME: 0820
DATE: 7/26/96

8/7/96 Delta Shipyard 4603-26 31 JLL

STATION NO.: D03-52-1
ORGANIC CLP#: FFE77
TAG #: 6-012817-19
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY37
TAG #: 6-012820
LOT #:
TIME: 0830
DATE: 7/26/96

STATION NO.: D04-51-1
ORGANIC CLP#: FFE78
TAG #: 6-012822-24
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: ~~MFGY27~~ MFGY38
TAG #: 6-012824
LOT #:
TIME: 0840
DATE: 7/26/96

8/7/96 Delta Shipyard 4603-26 31 JLS

STATION NO.: D05-51-1
ORGANIC CLP#: FFE79
TAG #: 6-012825-27
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY39
TAG #: 6-012828
LOT #:
TIME: 1030
DATE: 7/23/96

STATION NO.: D05-52-1
ORGANIC CLP#: FFE80
TAG #: 6-012829-31
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY40
TAG #: 6-012832
LOT #:
TIME: 1050
DATE: 7/23/96

84

8/7/96 Delta Shipyard 4603-26 31 JLI

STATION NO.: D06-51-1
ORGANIC CLP#: FFE82
TAG #: 6-012841-43
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY42
TAG #: 6-012844
LOT #:
TIME: 1115
DATE: 7/23/96

STATION NO.: D07-51-1
ORGANIC CLP#: FFF27
TAG #: 6-013063-65
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGW09
TAG #: 6-013066
LOT #:
TIME: 1130
DATE: 7/23/96

35

8/7/96 Delta Shipyard 4603-26 31 JLI

STATION NO.: D08-51-1
ORGANIC CLP#: FFE84
TAG #: 6-012849-51
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY44
TAG #: 6-012852
LOT #:
TIME: 1245
DATE: 7/23/96

STATION NO.: D09-51-1
ORGANIC CLP#: FFE85
TAG #: 6-012853
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY45
TAG #: 6-012856
LOT #:
TIME: 1300
DATE: 7/23/96

8/7/96 Delta Shipyard 4663-26-31 JLF

STATION NO.: D10-S1-1
ORGANIC CLP#: FFE86
TAG #: 6-012857-59
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY46
TAG #:
LOT #:
TIME: 1315
DATE: 7/23/96

STATION NO.: D11-S1-1
ORGANIC CLP#: FFE87
TAG #: 6-012861-63
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY47
TAG #: 6-012864
LOT #:
TIME: 1340
DATE: 7/23/96

8/7/96 Delta Shipyard 4663-26-31 JLF

STATION NO.: D12-S1-1
ORGANIC CLP#: FFE88
TAG #: 6-012865-67
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY48
TAG #: 6-012868
LOT #:
TIME: 1430
DATE: 7/23/96

STATION NO.: D13-S1-1
ORGANIC CLP#: FFE89
TAG #: 6-012869-71
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY49
TAG #: 6-012872
LOT #:
TIME: 1450
DATE: 7/23/96

JCL:
~~8/9~~ 8/7/96 Delta Shipyard 4663-26-31 JCL

STATION NO.: D14-51-1
ORGANIC CLP#: FFE91
TAG #: 6-012877-79
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY51
TAG #: 6-012880
LOT #: 02002014
TIME: 0915
DATE: 7/22/96

STATION NO.: D15-51-1
ORGANIC CLP#: FFE93
TAG #: 6-012889-91
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY53
TAG #: 6-012892
LOT #: 02002014
TIME: 0940
DATE: 7/22/96

8/7/96 Delta Shipyard 4663-26-31 JCL

STATION NO.: D16-51-1
ORGANIC CLP#: FFE94
TAG #: 6-012893-95
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: ~~6-012896~~ MFGY54
TAG #: 6-012896
LOT #: 02002014
TIME: 1005
DATE: 7/22/96

STATION NO.: D17-51-1
ORGANIC CLP#: FFE95
TAG #: 6-012897-99
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY55
TAG #: 6-012900
LOT #: 6-012900
TIME: 1100
DATE: 7/22/96

40

8/7/96 Della Shipyard 4603-26-31-II

STATION NO.: D18-S1-1

ORGANIC CLP#: FFE96

TAG #: 6-012901-03

4 OZ LOT #: ~~MFGY~~ ~~GLF~~

8 OZ LOT #:

INORGANIC CLP#: MFGY52

TAG #: 6-012904

LOT #:

TIME: 1140

DATE: 7/22/96

STATION NO.: D19-S1-1

ORGANIC CLP#: FFE97

TAG #: 6-012905-07

4 OZ LOT #:

8 OZ LOT #:

INORGANIC CLP#: MFGY57

TAG #: 6-012908

LOT #: 6-012908

TIME: 1200

DATE: 7/22/96

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8/7/96 Della Shipyard 4603-26-31 JLI

STATION NO.: D20-S1-1

ORGANIC CLP#: FFE98

TAG #: 6-012909-11

4 OZ LOT #:

8 OZ LOT #:

INORGANIC CLP#: MFGY58

TAG #: 6-012912

LOT #:

TIME: 1300

DATE: 7/22/96

STATION NO.: D21-S1-1

ORGANIC CLP#: FFE99

TAG #: 6-012913-15

4 OZ LOT #:

8 OZ LOT #:

INORGANIC CLP#: MFGY59

TAG #: 6-012916

LOT #:

TIME: 1310

DATE: 7/22/96

8/7/96 Delta Shipyard 4663-26-31 JLI.

STATION NO.: D22-51-1
ORGANIC CLP#: FFF00
TAG #: 6-012917-19
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY60
TAG #: 6-012920
LOT #:
TIME: 1320
DATE: 7/22/96

STATION NO.: D23-51-1
ORGANIC CLP#: FFF01
TAG #: 6-012921-23
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY61
TAG #: 6-012924
LOT #:
TIME: 1500
DATE: 7/22/96

8/7/96 Delta Shipyard 4663-26-31 JLI.

STATION NO.: D24-51-1
ORGANIC CLP#: FFF02
TAG #: 6-012925-27
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY62
TAG #: 6-012928
LOT #:
TIME: 1515
DATE: 7/22/96

STATION NO.: D25-51-1
ORGANIC CLP#: ~~FF0~~ FFF04
TAG #: 6-012937-39
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY64
TAG #: 6-012940
LOT #:
TIME: 1530
DATE: 7/22/96

44

8/8/96 Delta Shipyard 4603-26-51 JLI

STATION NO.: D26-51-1
ORGANIC CLP#: FFE67
TAG #: 6-012953-55
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY67
TAG #: 6-012956
LOT #:
TIME: 1410
DATE: 7/22/96

STATION NO.: ~~6~~ D27-51-1
ORGANIC CLP#: ~~6-012957-59~~ ~~FFE~~ FFE68
TAG #: 6-012957-59
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY68
TAG #: 6-012960
LOT #:
TIME: 1425
DATE: 7/22/96

45

8/8/96 Delta Shipyard 4603-26-51 JLI

STATION NO.: D28-51-1
ORGANIC CLP#: ~~FFE~~ FFE69
TAG #: 6-012961-63
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY69
TAG #: 6-012964
LOT #:
TIME: 1440
DATE: 7/22/96

STATION NO.: D29-51-1
ORGANIC CLP#: FFF10
TAG #: 6-012965-67
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY70
TAG #: 6-012968
LOT #:
TIME: 1540
DATE: 7/22/96

8/3/96 Tella Sheppard 4603-26-31 SLI

STATION NO.: D30-S1-1
ORGANIC CLP#: FFF11
TAG #: 6-01269-71
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY71
TAG #: 6-012972
LOT #:
TIME: 1600
DATE: 7/22/96

STATION NO.: D31-S1-1
ORGANIC CLP#: ~~6-012973-75~~ FFF12
TAG #: 6-012973-75
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY72
TAG #: 6-012976
LOT #:
TIME: 1605
DATE: 7/22/96

8/3/96 Tella Sheppard 4603-26-31 SLF

STATION NO.: D32-S1-1
ORGANIC CLP#: FFF25
TAG #: 6-013065-57
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGW05
TAG #:
LOT #:
TIME: 0830
DATE: 7/23/96

STATION NO.: D33-S1-1
ORGANIC CLP#: FFF26
TAG #: 6-013059-61
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGT95
TAG #: 6-013062
LOT #:
TIME: 0950
DATE: 7/23/96

48

8/8/96 Della Sheppard 4403-26-31 JCJ

STATION NO.: DB4-51-1
ORGANIC CLP#: FFF28
TAG #: 6-013067-69
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGWC4
TAG #: 6-013070
LOT #:
TIME: 1240
DATE: 7/23/96

STATION NO.: DC6-43-1
ORGANIC CLP#: FFE81
TAG #: 6-012833-39
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY41
TAG #: 6-012839-40
LOT #:
TIME: 1740
DATE: 7/24/96

49

8/8/96 Della Sheppard 4403-26-31 JCL

STATION NO.: DC7-43-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1230
DATE: 7/23/96

STATION NO.: DI1-43-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1410
DATE: 7/23/96

50

8/8/96 Delta Shipyard 4603-26-31 SLI

STATION NO.: B01-21-1
ORGANIC CLP#: FFF21
TAG #: 6-013029-26
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY81
TAG #: 6-013027-30
LOT #:
TIME: 1130
DATE: 7/24/96

STATION NO.: B01-45-1
ORGANIC CLP#: FFF22
TAG #: 6-013031-36
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY82
TAG #: 6-013037-38
LOT #:
TIME: 1600
DATE: 7/24/96

51

8/8/96 Delta Shipyard 4603-26-31

STATION NO.: BC1-51-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1030
DATE: 7/24/96

STATION NO.: BC1-51-2
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1330
DATE: 7/24/96

52

8/8/96 Delta Shipyard 46C 3-26-31 JCI

STATION NO.: BC1-S2-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1640
DATE: 7/24/96

STATION NO.: BC2-22-1
ORGANIC CLP#: FFE24
TAG #: 6-013047-51
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY86
TAG #: 6-013053-54
LOT #:
TIME: 1750
DATE: 7/24/96

53

8/8/96 Delta Shipyard 46C 3-26-31 JCI

STATION NO.: BC2-21-1
ORGANIC CLP#: FFE23
TAG #: 6-013039-44
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: MFGY83
TAG #: 6-013045-46
LOT #:
TIME: 1645
DATE: 7/24/96

STATION NO.: BC2-S1-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1700
DATE: 7/24/96

8/9/96 Delta Shipyard 4603-26-31 JLJ

STATION NO.: B02-S1-2
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1710
DATE: 7/24/96

STATION NO.: B02-S1-3
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1720
DATE: 7/24/96

8/9/96 Delta Shipyard 4603-26-31 JLJ

STATION NO.: B01-T1-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1500
DATE: 7/25/96

STATION NO.: B02-T1-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: ~~7/25/~~ (JLJ) 1430
DATE: 7/25/96

4603-26-SI

8/8/96 Delta Shipyard 4603-26-SI JIT

STATION NO.: PC3-71-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1315
DATE: 7/25/96

STATION NO.: PC4-71-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1250
DATE: 7/25/96

8/8/96 Delta Shipyard 4603-26-SI JIT

STATION NO.: PC5-71-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1100
DATE: 7/25/96

STATION NO.: PC5-72-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: 1120
DATE: 7/25/96

58

8/3/96 Della Shipyard 4603-26-31 JLS

STATION NO.: PO6-71-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #:
TIME: ~~7/25/96~~ 1200
DATE: 7/25/96

STATION NO.: WO1-11-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #: 0200201H
TIME: 1345
DATE: 7/24/96

59

8/2/96 Della Shipyard 4603-26-31 JLT

STATION NO.: WO2-11-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #: 0200201H + 0100201H
TIME: 1430
DATE: 7/24/96

STATION NO.: WO2-12-1
ORGANIC CLP#: NA
TAG #:
4 OZ LOT #:
8 OZ LOT #:
INORGANIC CLP#: NA
TAG #:
LOT #: 0200201H
TIME: 1450
DATE: 7/24/96

8/8/96 Delta Shipyard 4603-96-31 JCL

STATION NO.: PO 1003-11-1 JCL

ORGANIC CLP#: NA

TAG #:

4 OZ LOT #:

8 OZ LOT #:

INORGANIC CLP#: NA

TAG #:

LOT #: 0160 201 H

TIME: 1415

DATE: 7/24/96

STATION NO.: P02-43-1

ORGANIC CLP#: FF1-06

TAG #: 6-012945-50

4 OZ LOT #:

8 OZ LOT #:

INORGANIC CLP#: MFG Y66

TAG #: 6-012941-52

LOT #:

TIME: 1000

DATE: ~~7/24/96~~ JCL 7/25/96

REFERENCE 5

~~88501~~

3012 Site

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

REGION	SITE NUMBER (to be assigned by Hq)
VI	LA 01317

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Tack Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Delta Shipyard

B. STREET (or other identifier): 202 Industrial Boulevard

C. CITY: Houma | D. STATE: LA | E. ZIP CODE: 70361 | F. COUNTY NAME: Terrebonne

G. SITE OPERATOR INFORMATION

1. NAME: Ralph Arceneaux, President
Delta Shipyard

2. TELEPHONE NUMBER: (504) 868-7450

3. STREET: P.O. Box 101 | 4. CITY: Houma | 5. STATE: LA | 6. ZIP CODE: 70361

H. REALTY OWNER INFORMATION (if different from operator of site)

1. NAME: Delta Services Industries

2. TELEPHONE NUMBER: (504) 868-7450

3. CITY: Houma (P.O. Box 101) | 4. STATE: LA | 5. ZIP CODE: 70361

I. SITE DESCRIPTION: see attachment

J. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.):

B. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☐ 3. LOW ☒ 4. NONE

C. PREPARER INFORMATION

1. NAME: Thomas Myers | 2. TELEPHONE NUMBER: (201) 560-1650 | 3. DATE (mo., day, & yr.): 9/12/84

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME: Thomas Myers | 2. TITLE: Geologist

3. ORGANIZATION: The Earth Technology Corporation | 4. TELEPHONE NO. (area code & no.): (201) 560-1650

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
None		

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
Ralph Arceneaux	President (504) 868-7450	P.O. Box 101, Houma, LA 70361

SUPERFUND FILE

APR 30 1992

REORGANIZED

LAD 058475419

Reviewed by 6AW-SC 12/?/84

Continued From Front

III. INSPECTION INFORMATION (continued)

D. GENERATOR INFORMATION (sources of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Delta Shipyard	(504) 868-7450	P.O. Box 101, Houma, LA 70361	oily waste-recovered and sold to recyclers

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
None			

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS
None		

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
9/12/84	1:30-4:00	[X] 1. PERMISSION [ ] 2. WARRANT

J. WEATHER (describe)

sunny, high in the 90's

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER (specify) None		see attachment	

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS
None		

 Continue On Page 3

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL

2. PHOTOS IN CUSTODY OF: see attachment

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: see attachment

E. COORDINATES

1. LATITUDE (deg.-min.-sec.): 29^{0} 34' 02" N

2. LONGITUDE (deg.-min.-sec.): 90^{0} 42' 18" W

V. SITE INFORMATION

A. SITE STATUS

[ ] 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

[X] 2. INACTIVE (Those sites which no longer receive wastes.) 2 closed oil pits

[ ] 3. OTHER (specify): (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES (specify generator's four-digit SIC Code): None

C. AREA OF SITE (in acres): 36

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [X] 2. YES (specify): Office and administration building

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
						X	
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY	X	4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		(closed under LA DEQ supervision)

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [X] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [ ] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [X] 8. FLAMMABLE

[ ] 9. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes, manifests.

 Continue On Reverse

Continued From Front

VII. WASTE RELATED INFORMATION (continued)

2. Estimate the amount *(specify unit of measure)* of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT: None	AMOUNT: 125	AMOUNT: None	AMOUNT: None	AMOUNT: None	AMOUNT: None
UNIT OF MEASURE:	UNIT OF MEASURE: bbl /month	UNIT OF MEASURE:	UNIT OF MEASURE:	UNIT OF MEASURE:	UNIT OF MEASURE:
'X' (1) PAINT, PIGMENTS	'X' X (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	X (2) OTHER *(specify)*: Leaded tank bottoms	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW	NOTE: all waste oil is sold to reclaimers	(3) OTHER *(specify)*:	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER *(specify)*:			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER *(specify)*:
			(6) CYANIDE	(6) OTHER *(specify)*:	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER *(specify)*:		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE *(place in descending order of hazard)*

1. SUBSTANCE	2. FORM *(mark 'X')* a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY *(mark 'X')* a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Leaded tank bottoms	X	X		X				68476-53-9	62.5	bbl/mo
Slop oil		X			X			68477-26-9	62.5	bbl/mo

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

☐ A. HUMAN HEALTH HAZARDS

 Continue On Page 5

Continued From Page 4

VIII. HAZARD DESCRIPTION (continued)

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☐ E. CONTAMINATION OF FOOD CHAIN

☐ F. CONTAMINATION OF GROUND WATER

☐ G. CONTAMINATION OF SURFACE WATER

 Continue On Reverse

Continued From Front

VIII. HAZARD DESCRIPTION (continued)

☐ H. DAMAGE TO FLORA/FAUNA

☐ I. FISH KILL

☐ J. CONTAMINATION OF AIR

☐ K. NOTICEABLE ODORS

☐ L. CONTAMINATION OF SOIL

☐ M. PROPERTY DAMAGE

 Continue On Page 7

Continued From Page 6

VIII. HAZARD DESCRIPTION (continued)

☐ N. FIRE OR EXPLOSION

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☐ Q. EROSION PROBLEMS

☐ R. INADEQUATE SECURITY

☐ S. INCOMPATIBLE WASTES

Continue On Reverse

VIII. HAZARD DESCRIPTION *(continued)*

☐ T. MIDNIGHT DUMPING

☐ U. OTHER *(specify)*:

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE *(specify units)*
1. IN RESIDENTIAL AREAS	1,000	1,000	300	1 mile
2. IN COMMERCIAL OR INDUSTRIAL AREAS	2,500	2,500	25	1 mile
3. IN PUBLICLY TRAVELLED AREAS	0	0	0	1 mile
4. PUBLIC USE AREAS *(parks, schools, etc.)*	0	0	0	1 mile

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER *(specify unit)*	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
2 feet	South	None
D. POTENTIAL YIELD OF AQUIFER	**E. DISTANCE TO DRINKING WATER SUPPLY** *(specify unit of measure)*	**F. DIRECTION TO DRINKING WATER SUPPLY**
Unknown	0.5 miles	West

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY < 15 CONNECTIONS

☒ 2. COMMUNITY *(specify town)*: Houma Water Dept. - Bayou Black
> 15 CONNECTIONS

☒ 3. SURFACE WATER

☐ 4. WELL

 Continue On Page 9

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
None				

I. RECEIVING WATER

1. NAME
Houma Navigation Canal

☐ 2. SEWERS ☒ 3. STREAMS/RIVERS
☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER(specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

Secondary contact recreation and propagation of fish and wildlife.

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☒ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND
☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	'X'	C. OTHER (specify below)
X					
	1. SAND				
X	2. CLAY				
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☐ C. HIGH (1000 to 10 cm/sec.)
☐ D. MODERATE (10 to .1 cm/sec.) ☐ E. LOW (.1 to .001 cm/sec.) ☒ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS:

H. DISCHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE
0%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.
South

J. OTHER GEOLOGICAL DATA

Fresh water may be contained in buried distributary channels along Bayou Lafourche but any development of these reservoirs would be very limited due to salt water encroachment. Pleistocene terrace deposits beneath these Holocene deltaic sequences are connected to surface waters and any contamination of these aquifers could reach surface reservoirs.

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the [illegible] and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X') 1. YES	2. NO	3. UNKNOWN
State	HWMP	GD 343I1	10/22/80	Interim	X		
RCRA	EPA	LAD 058473413	Unknown	None	X		

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

[XX] NONE [ ] YES *(summarize in this space)*

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

ATTACHMENT A

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT SUPPLEMENT SHEET

LA 01317

Instruction - This sheet is provided to give additional information in explanation of a question on the form T2070-3.

Corresponding number on form	Additional Remark and/or Explanation
I., I.	This facility cleans and repairs oil barges. Two oil/water separator pits were utilized to recover the waste oil generated from the barge cleaning operations. Earlier this year the pits were drained and the bottom sludge was sampled. The test results from this sampling were reviewed by the LA DEQ Hazardous Waste Division, and closure of the pits by backfilling was approved. The oil sludge remaining in the pits was mixed with 30 cubic yards of sandy soil. An above ground steel tank separator has replaced the pits.
IV., A., i.	Since closure of the pits was approved by the State Hazardous Waste Division, no samples will be collected.

LA01317

ATTACHMENT B

REJECTION FORM

HAZSIT #	SITE NAME	FORM # and DATE COMPLETED by STATE
LA 1317	Delta Shipyard	2070-3 / 9/12/84

EXPLANATION FOR REJECTION:
(DEFICIENCIES)

* Report does not reflect the existence of the two monitoring wells other than a site map.
  - If well samples were taken during the time of the State-approved closure, provide this data and any other data pertinent to site closure. ⊙ Review state files.

* VICINITY MAP EXHIBIT "B" is very poor in quality.

SUGGESTED REMEDY FOR DEFICIENCIES: Provide a superior reproduction or a different map of sufficient quality. (must be able to read elevations)

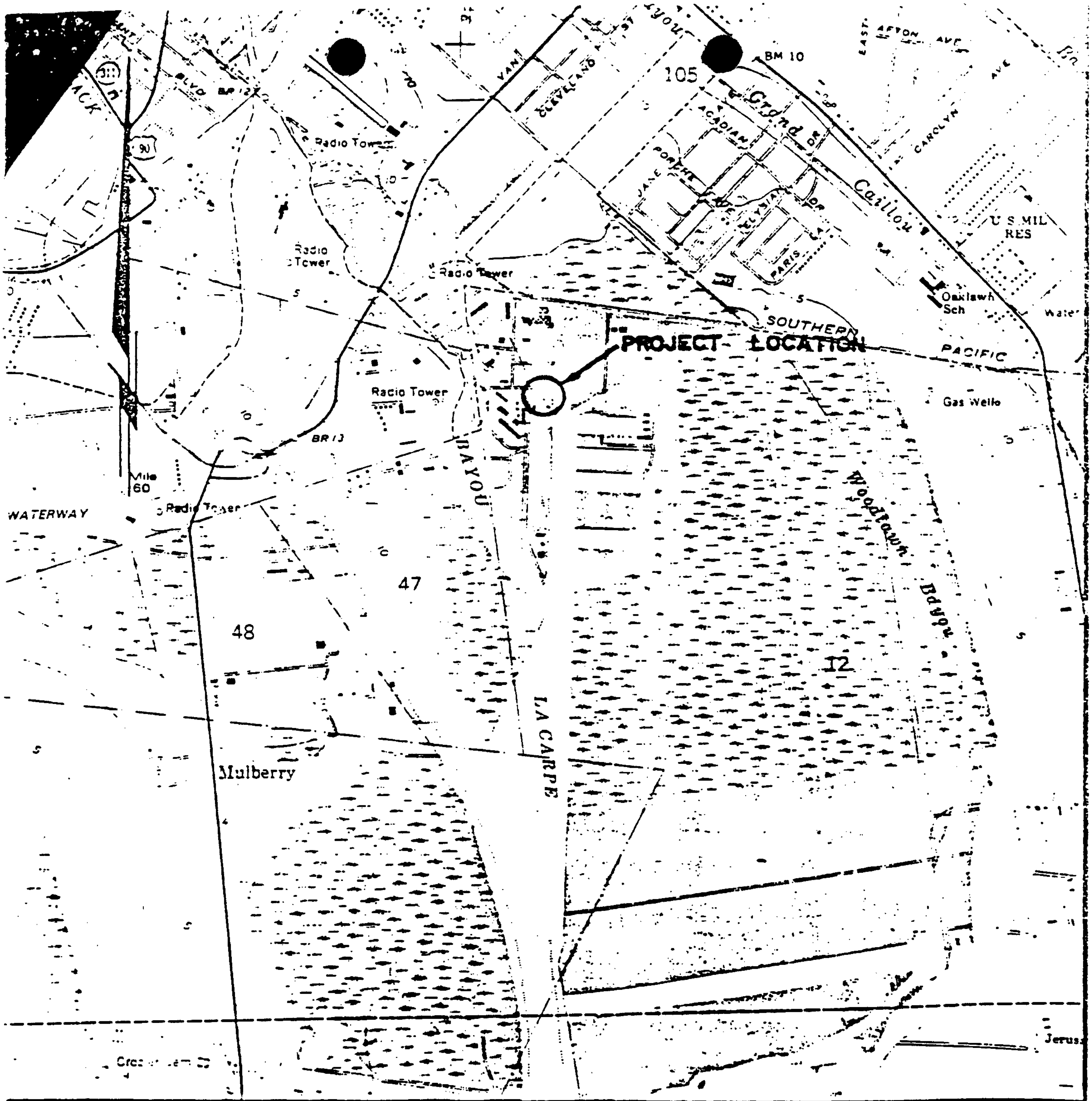
⊙ Contact U.S.G.S. or L.G.S. for assistance.

AS NOTED.

SIGNATURE: Gary W. Brown

NAME OF REVIEWER

DATE: 18DEC84

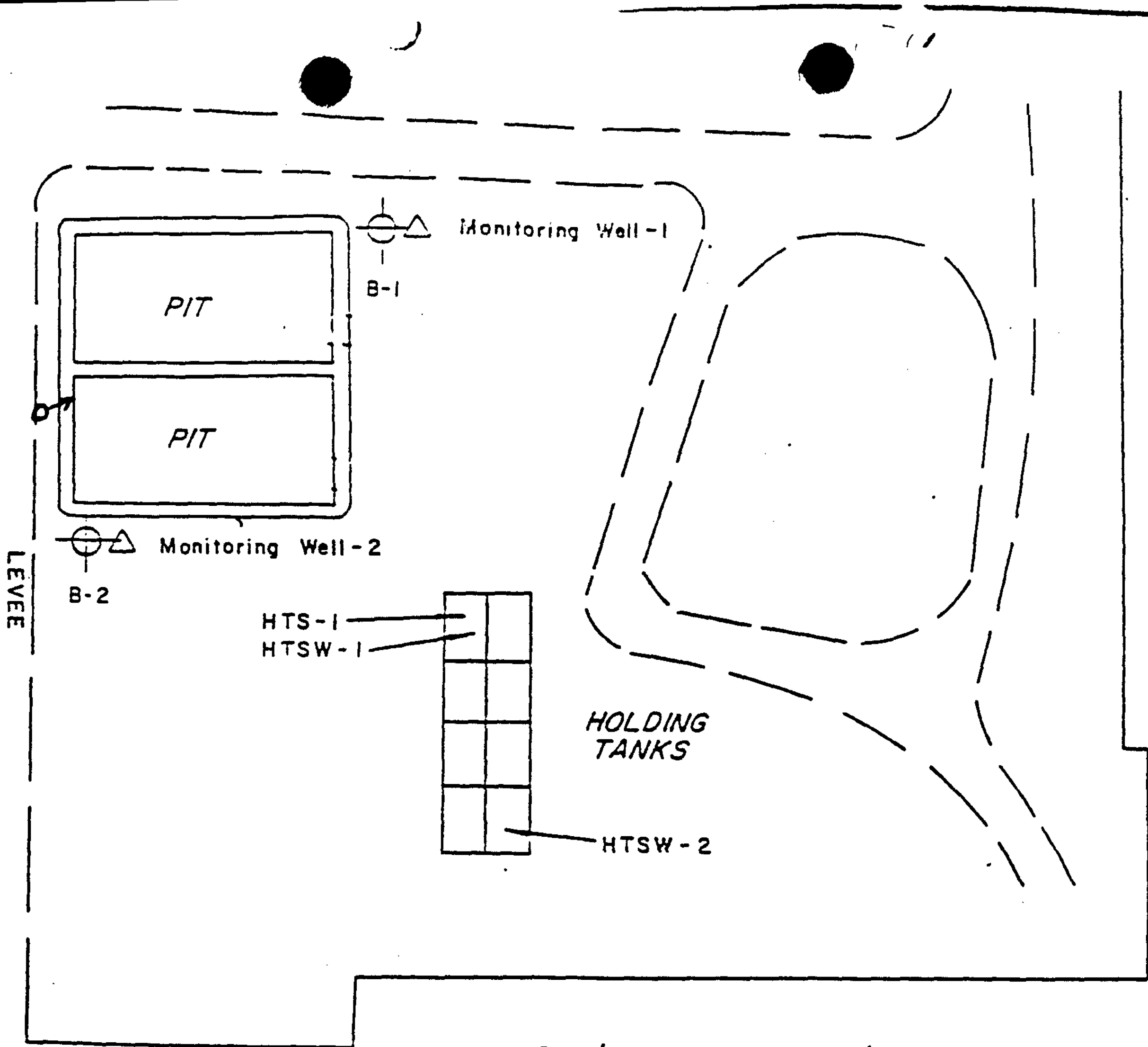


TAKEN FROM U.S.G.S. HOUMA, LA. QUADRANGLE MAP, 1963.

SCALE IN FEET

1000 0 1000 2000 3000 4000 5000 6000 7000

VICINITY MAP
EXHIBIT "B"



Delta Shipyard LA 01317
Site Map

MONITORING WELLS
B-1 (3" by 13')
B-2 (3" by 20')

Photograph Location and direction

SURFACE IMPOUNDMENTS SITE INSPECTION REPORT
(Supplemental Report) LA 01317

INSTRUCTION
Answer and Explain as Necessary.

1. TYPE OF IMPOUNDMENT
Two secondary oil/water separator pits.

2. STABILITY/CONDITION OF EMBANKMENTS
The pits have been backfilled and closed.

3. EVIDENCE OF SITE INSTABILITY *(Erosion, Settling, Sink Holes, etc.)*
[ ] YES [X] NO

4. EVIDENCE OF DISPOSAL OF IGNITABLE OR REACTIVE WASTE
[ ] YES [X] NO

5. ONLY COMPATIBLE WASTES ARE STORED OR DISPOSED OF IN THE IMPOUNDMENT
[X] YES [ ] NO

6. RECORDS CHECKED FOR CONTENTS AND LOCATION OF EACH SURFACE IMPOUNDMENT
[X] YES [ ] NO

7. IMPOUNDMENT HAS LINER SYSTEM
[X] YES [ ] NO located in clay soil

7a. INTEGRITY OF LINER SYSTEM CHECKED
[ ] YES [X] NO

7b. FINDINGS
Subsurface soils have a permeability of 10^{-7} to 10^{-8} cm/sec.

8. SOIL STRUCTURE AND SUBSTRUCTURE
Silty clay with traces of sand extend to a depth of 40-50 feet.

9. MONITORING WELLS
[X] YES [ ] NO 2 wells, B-1 is 13 feet deep and B-2 is 20 feet deep.

10. LENGTH, WIDTH, AND DEPTH
LENGTH 75' (each) WIDTH 40' (each) DEPTH 5' (each)

11. CALCULATED VOLUMETRIC CAPACITY
15,000 cubic feet

12. PERCENT OF CAPACITY REMAINING
Closed pits - N/A

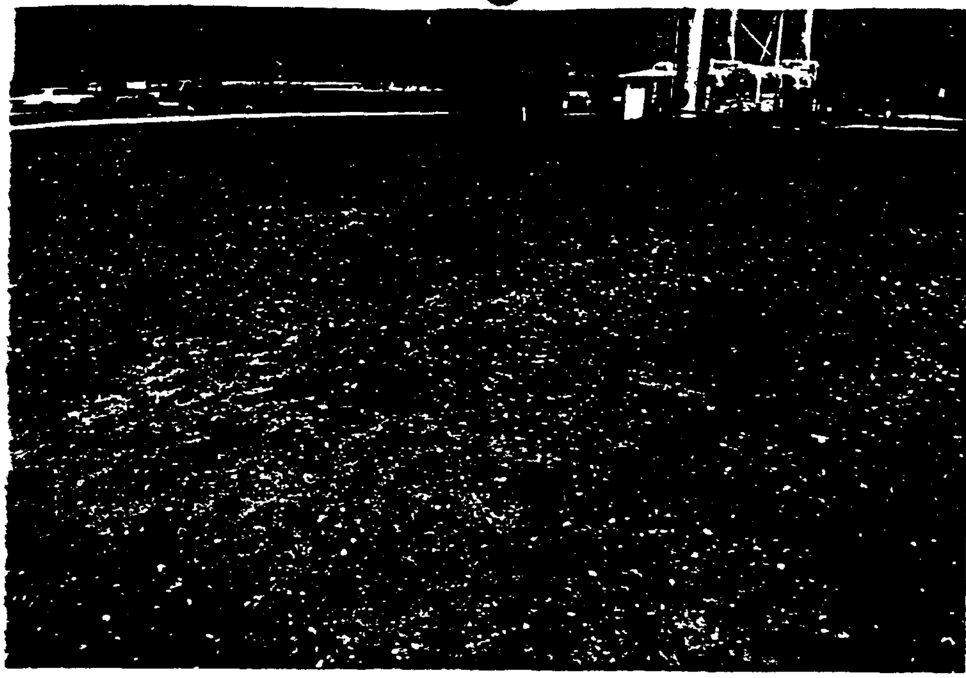
13. ESTIMATE FREEBOARD
N/A

14. SOLIDS DEPOSITION
[X] YES [ ] NO Low solids deposited

15. DREDGING DISPOSAL METHOD
None

16. OTHER EQUIPMENT
None

Delta Shipyard
LA 01317



Photographer / Witness

Thomas Myers

Date / Time / Direction

9/12/84, 3:00pm, Northeast

Comments: Closed oil/water separator pits

Photographer / Witness

Date / Time / Direction

Comments:

Photographer / Witness

Date / Time / Direction

Comments:

REFERENCE 6

~~88502~~

WINK ENGINEERING

A DIVISION OF WINK INCORPORATED

MECHANICAL
CIVIL
ELECTRICAL
PROCESS
INSTRUMENT

7520 HAYNE BLVD ■ NEW ORLEANS, LA 70126-1899 ■ TELEPHONE 504/240-7924

JULY 5, 1985

MR. GLENN A. MILLER
ADMINISTRATOR
LOUISIANA DEPARTMENT OF
ENVIRONMENTAL QUALITY
P.O. BOX 44066
BATON ROUGE, LA 70804

LETTER NO.: WM59-5
RE: DELTA SHIPYARD'S WASTE SITES AT HOUMA & DUSON, LOUISIANA
WINK JOB NO.: 59-051485

DEAR MR. MILLER:

THIS LETTER AND ITS ATTACHMENTS ARE PREPARED PURSUANT TO MY TELEPHONE CONVERSATIONS ON JUNE 5, 1985, WITH MESSRS. DUDLEY DEVILLE AND TOM PATTERSON OF YOUR OFFICE. WINK, INC., AN INDEPENDENT CONSULTING ENGINEERING FIRM, HAS BEEN RETAINED TO DETERMINE IF THE ABOVE REFERENCED SITES ARE HAZARDOUS.

~~THERE ARE CURRENTLY SIX (6) SURFACE IMPOUNDMENTS AT DELTA'S HOUMA YARD. THREE (3) ARE COVERED AND OVERGROWN WITH VEGETATION, WHILE THE REMAINING THREE (3) ARE EXPOSED AND FILLED WITH SLUDGE.~~ AT THE DUSON YARD THERE IS A SUBMERGED, UNCOVERED STEEL TANK FILLED WITH A LIQUID SUBSTANCE. ACCORDING TO OUR RESEARCH, ALL SITES WERE ONCE USED TO DISPOSE OF OIL FIELD DRILLING MATERIAL. THIS PRACTICE CEASED ABOUT 10 YEARS AGO; HOWEVER, IT APPEARS FROM OUR ANALYSIS DUMPING HAS OCCURRED INTERMITTENTLY SINCE THEN. SEVERAL SURFACE SPILLS WERE OBSERVED ON THESE PROPERTIES AND A CHEMICAL ANALYSIS WAS SUBSEQUENTLY MADE.

AT ONE TIME THE SURFACE IMPOUNDMENTS AT HOUMA WERE REGISTERED WITH THE DEPARTMENT OF ENVIRONMENTAL QUALITY AS HAZARDOUS WASTE SITES, BUT WERE RECOMMENDED BY YOUR ENFORCEMENT AGENCY IN JANUARY, 1984, TO BE REMOVED FROM THE HAZARDOUS WASTE SYSTEM. CURRENTLY, THESE IMPOUNDMENTS ARE IN THE INACTIVE CLASSIFICATION AS CONFIRMED BY TELEPHONE ON JUNE 5, 1985. TO DETERMINE THE SLUDGE AND LIQUID CHEMICAL COMPOSITION AND THEREFORE THE POTENTIALLY HAZARDOUS NATURE OF THESE SITES, NUMEROUS SAMPLES WERE COLLECTED AT RANDOM LOCATIONS AS INDICATED IN ATTACHMENTS 1, 2, 3, 4, & 5. IMPOUNDMENTS 1, 2, 3 IN HOUMA ARE COVERED WITH A THIN CRUST OF FILL WHILE NOS. 5, 6, 7 ARE EXPOSED. HOUMA AREA NO. 4 AND DUSON AREA NOS. 2 & 3 ARE ESSENTIALLY LOW SPOTS WHERE ACCUMULATIONS OF SLUDGE HAVE SETTLED. DUSON AREA NO. 1 CONSISTS OF A SUBMERGED STEEL TANK OF UNKNOWN DEPTH CONTAINING A LIQUID SUBSTANCE. SOIL SAMPLES WERE TAKEN AT VARIOUS DEPTHS APPROXIMATELY 8" FROM THE SUBMERGED TANK TO CHECK FOR LEAKAGE.

ALL INDIVIDUAL SAMPLES FROM EACH IMPOUNDMENT/AREA WERE THOROUGHLY MIXED TO FORM A COMPOSITE SAMPLE FOR EACH LOCATION. LABORATORY ANALYSES WERE PERFORMED BY WEST-PAINE OF BATON ROUGE, AND THE RESULTS ARE CONTAINED IN ATTACHMENT NO. 6.

THE FOLLOWING TESTS WERE PERFORMED ON EACH SAMPLE: VOA (VOLATILE ORGANIC AROMATICS), CYANIDE, PHENOL (TOTAL), FLASH POINT (BELOW 140^{0}F), PH, EP TOXICITY, AND OIL & GREASE. BASED ON THE ATTACHED ANALYSES, THE ~~EP TOXICITY CONSTITUENTS DO~~ NOT EXCEED THOSE LIMITS DESCRIBED IN CHAPTER 24, TABLE 5. NEITHER DO THE SUMMATION OF CONSTITUENTS LISTED IN PARAGRAPHS 24.1 (D) AND (E) AND CHAPTER 17 EXCEED 1000 PPM. IT IS OUR OPINION THAT THESE SITES ARE NOT TO BE CONSIDERED HAZARDOUS AND WILL NOT NOW OR IN THE FUTURE POSE A THREAT TO HUMAN HEALTH OR THE ENVIRONMENT.

IF YOUR OFFICE IS IN AGREEMENT THAT THESE FACILITIES ARE NOT HAZARDOUS, PLEASE FURNISH THE NECESSARY DOCUMENTS TO AUTHORIZE DECLASSIFICATION OR CONFIRM THAT YOU HAVE CLOSED OUT YOUR FILE.

VERY TRULY YOURS,

Conrad Dussel

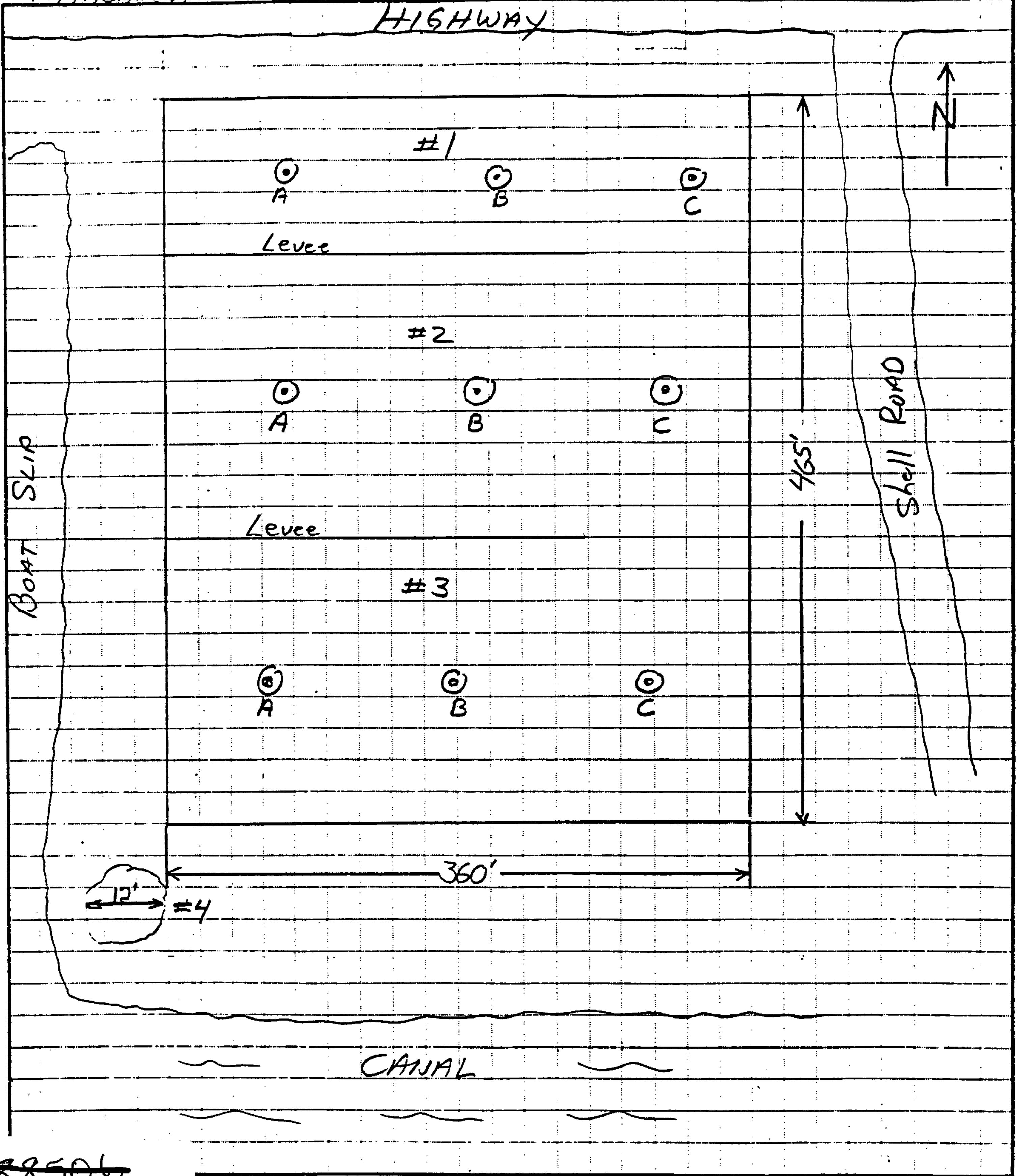
CONRAD A. DUSSEL, P.E.
PROJECT ENGINEER

CAD:MLV
ATTACHMENTS
CC: DUDLEY DEVILLE (DEQ)
TOM PATTERSON (DEQ)
HOWARD SEIFE (MILBANK, ET.AL.)

WINK ENGINEERING
A Division of Wink, Inc.
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899
(504) 246-7924

JOB DELT Shipyard - Houma, LA
SHEET NO. 1 OF 1
CALCULATED BY CAO DATE 6/18/85
CHECKED BY ____ DATE ____
SCALE 3 Covered Pits / 1 open Spill

Attachment No 1



~~88506~~

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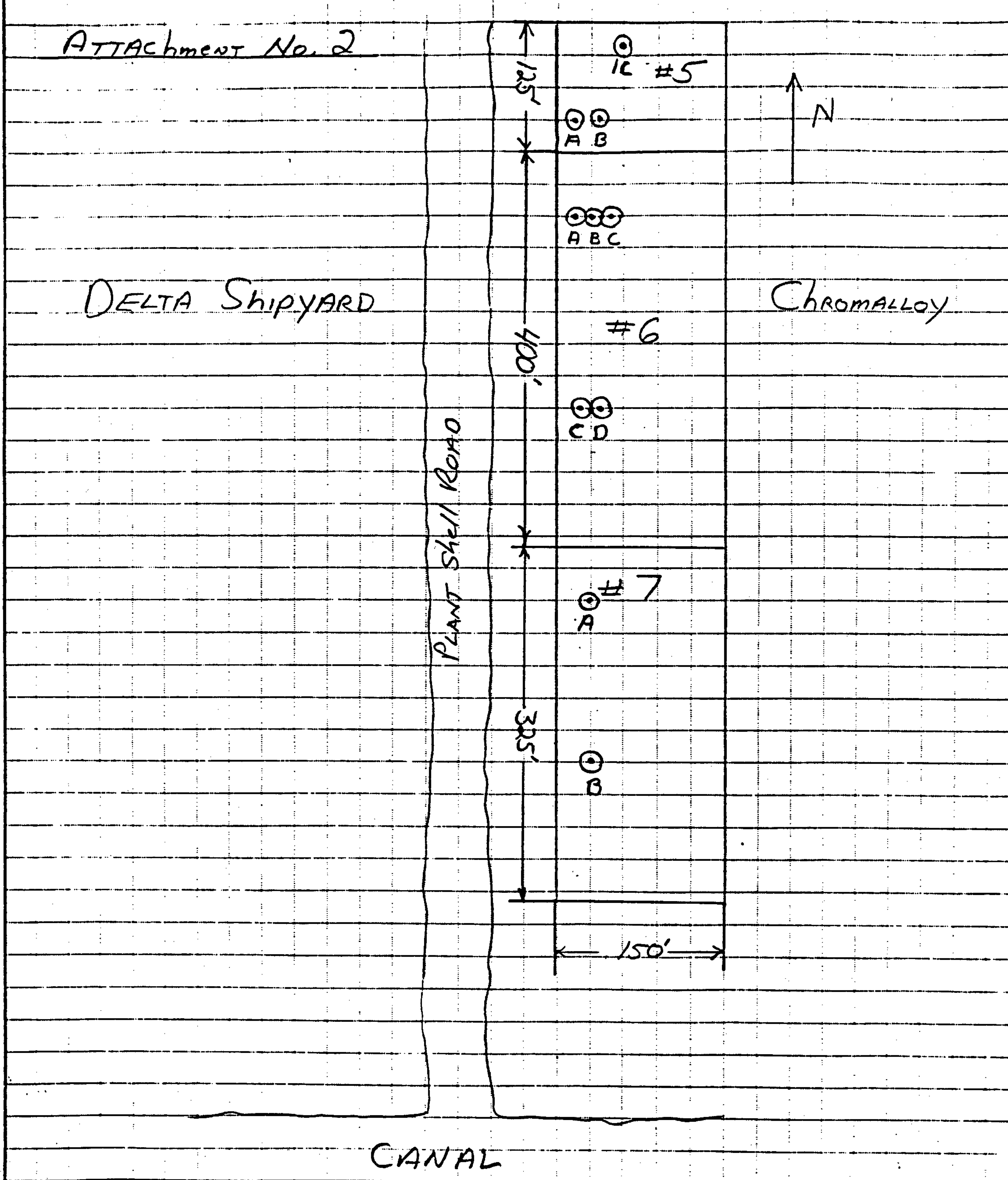
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899
(504) 246-7924

JOB: DELTA Shipyard-Houma, LA
SHEET NO. 1 OF 1
CALCULATED BY: CAM DATE: 6/18/85
CHECKED BY: DATE:
SCALE: 3 Exposed Surf. Impoundments

ATTAchment No. 2



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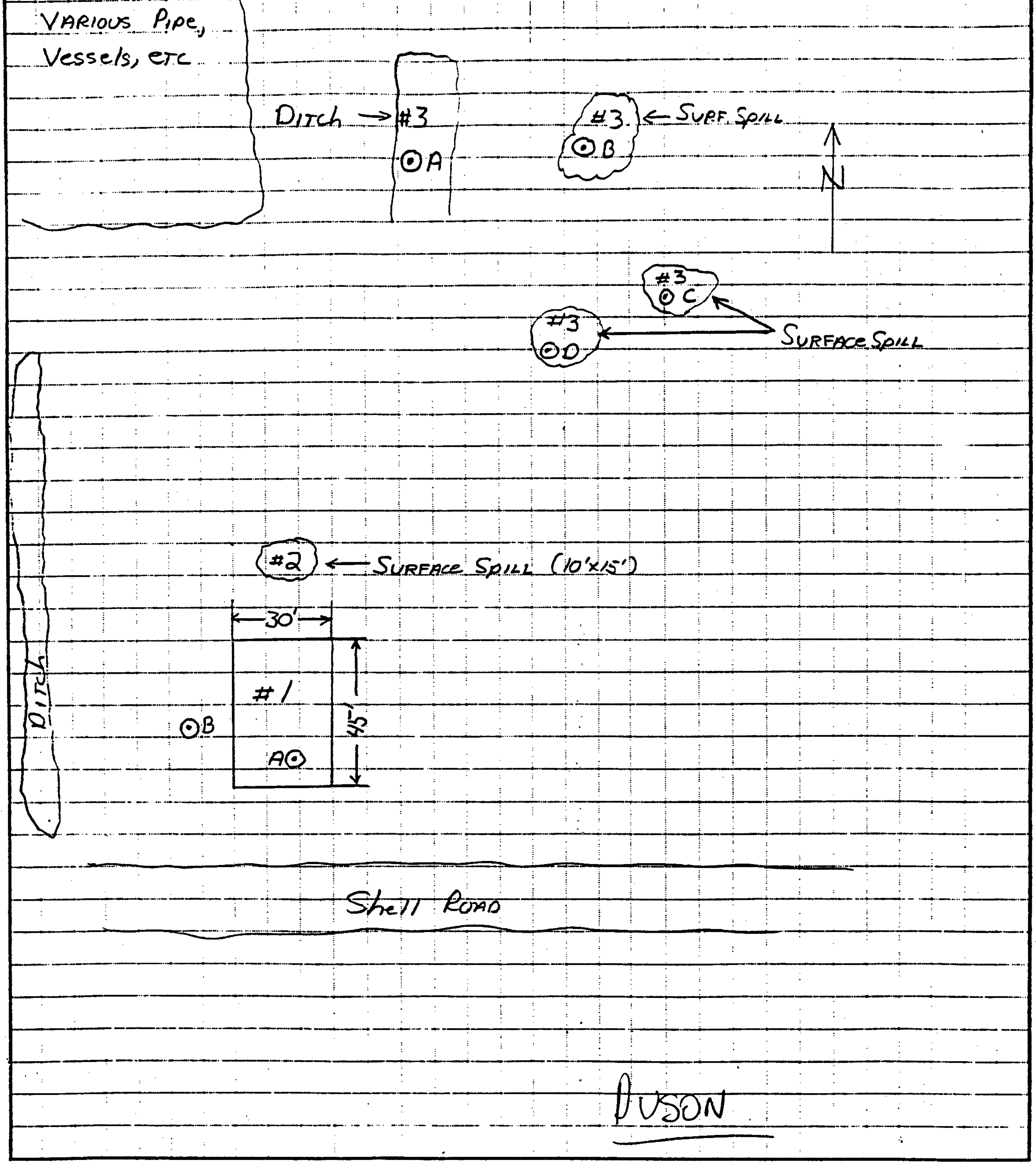
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899
(504) 246-7924

JOB: DELTA SHIPYARD – DUSON, LA
SHEET NO. 1 OF 1
CALCULATED BY: CAD DATE: 6/18/85
CHECKED BY: DATE:
SCALE: 1 SUBMERGED TANK + MISC. SPILLS

ATTACHMENT No. 3



ATTACHMENT NO. 4
DELTA SHIPYARD SLUDGE SAMPLING PROTOCOL
HOUMA, LA
MAY 20, JUNE 5 & JUNE 6, 1985

SAMPLE NO.	DEPTH	SAMPLE NO.	DEPTH
1A	1'-6"	5A	2'-0"
1A	2'-6"	5A	3'-0"
1A	4'-6"	5A	4'-0"
1A	5'-6"	5A	5'-6"
1B	1'-0"	5B	0'-6"
1B	3'-0"	5B	1'-6"
1B	5'-6"	5B	3'-6"
1C	SURFACE	5B	5'-0"
1C	2'-0"	5C	SURFACE
1C	3'-0"	5C	1'-0"
1C	4'-6"	5C	2'-0"
1C	5'-6"	5C	5'-6"
2A	1'-0"	6A	0'-6"
2A	3'-6"	6A	2'-0"
2A	5'-6"	6A	4'-0"
2B	0'-6"	6B	1'-0"
2B	2'-6"	6B	2'-6"
2B	4'-0"	6B	3'-6"
2C	1'-0"	6B 16	5'-6"
2C	3'-0"	6C	1'-0"
2C	5'-6"	6C	2'-0"
3A	0'-6"	6C	3'-0"
3A	1'-6"	6C	4'-0"
3A	3'-6"	6C	5'-0"
3A	4'-6"	6D	SURFACE
3B	1'-0"	6D	1'-6"
3B	3'-0"	6D	2'-6"
3C	0'-6"	6D	3'-0"
3C	2'-0"	7A	SURFACE
3C	4'-0"	7A	2'-0"
4	SURFACE SAMPLES	7A 6	3'-0"
		7B	0'-6"
		7B	2'-6"
		7B	4'-0"

ATTACHMENT NO. 5
DELTA SHIPYARD SLUDGE SAMPLING PROTOCOL
DUSON, LA
JUNE 5, 1985

SAMPLE NO.	DEPTH
1A	SURFACE (LIQUID)
1B	0'-6" (WITHIN 8" OF PIT
1B	1'-0"
1B	3'-6"
1B	5'-0"
2	0'-6"
2	1'-0"
2	3'-0"
3A	SURFACE
3B	SURFACE
3C	SURFACE
3D	SURFACE

WEST·PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

SAMPLE ANALYSES

for

WINK ENGINEERING
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899

ATTENTION: Mr. Conrad A. Dussel

June 11, 1985

WEST-PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Samples collected by Wink Engineering as documented by the enclosed chain-of-custody form, were received at West-Paine Laboratories, Incorporated on June 5, 1985 and June 7, 1985. The samples were analyzed according to the Environmental Protection Agency protocol:

A. Test Methods for Evaluating Solid Waste, SW-846, July 1982:

Parameter	Method
Cyanide	9010
Ignitability	1010
EP Toxicity Extraction Procedure	1310
Arsenic	7060
Barium	7080
Cadmium	7130
Chromium	7190
Lead	7420
Mercury	7470
Selenium	7740
Silver	7760
Volatile Organic Fraction	8240
pH	9040

B. Standard Methods for the Examination of Water and Wastewater, 15th Edition, 1980:

Parameter	Method
Oil & Grease	503C

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WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

C. Standard Methods for the Examination of Water and Wastewater, 14th Edition, 1979:

Parameter	Method
Phenol	510A, 510B

The results are on the following pages.

Victor O. Blanchard, III
Manager

WEST·PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: DUSON #1 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.53	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	8.5	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	36,100	10.0/8.4	06-10/1600/RH

DUSON

WEST·PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: DUSON #2 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.43	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.2	7.0/7.0	06-10/1200/RC
Flashpoint (^{O}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	53,000	10.0/8.4	06-10/1600/RH

DUSON

na1

WEST·PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

Sample Identification: DUSON #3 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.0	7.0/7.0	06-10/1200/RC
Flashpoint (^{O}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	163,000	10.0/8.4	06-10/1600/RH

Duson

WEST·PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: [redacted]

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	<0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	7.7	7.0/7.0	06-10/1200/RC
Flashpoint (^{O}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	4,650	10.0/8.4	06-10/1600/RH

HOUMA

WEST·PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

Sample Identification: HOUMA #2 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	<0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	8.2	7.0/7.0	06-10/1200/RC
Flashpoint (^{O}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	2,980	10.0/8.4	06-10/1600/RH

nal

85-2082

WEST·PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

Sample Identification: HOUMA #3 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	<0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	7.4	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	150	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	3,100	10.0/8.4	06-10/1600/RH

nal

85-2082

WEST-PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

Sample Identification: [redacted]

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.69	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	7.8	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	311,000	10.0/8.4	06-11/0900/RH

nal

85-2082

WEST·PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

Sample Identification: HOUMA #5 Composite

Date Received: June 7, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	3.0	0.020/0.020	06-10/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.1	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	104,000	10.0/8.4	06-11/0900/RH

nal

85-2082

WEST-PAINE
Laboratories INC.
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WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: HOUMA #6 Composite

Date Received: June 7, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	2.5	0.020/0.020	06-10/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.3	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	183,000	10.0/8.4	06-11/0900/RH

CORRECTED REPORT

WEST·PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE LA 7082[illegible]

WINK ENGINEERING
New Orleans, Louisiana
May 29, 1985

Sample Identification: #7 HOUMA COMPOSITE

Date Received: May 21, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	2.3	0.020/0.020	05-24/1630/BE
Cyanide (mg/kg CN)	<0.2	0.10/0.11	05-26/1100/RC
pH (Units) as 4% w/v	9.0	7.0/7.0	05-24/1300/RC
Flashpoint (^{o}F)	>200	------	Not Applicable
Oil & Grease (mg/kg)	331,000	10.0/9.2	05-23/2000/FT

WEST-PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: DUSON #1, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.3	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.008	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 104.44 gm

Duson

nal

85-2082

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: DUSON #2, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.2	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.64 gm

nal

WEST·PAINE
Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: DUSON #3, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.3	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	0.12	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.77 gm

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Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: ~~HOUMA #1, Composite~~

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	<0.1	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.012	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 100.84 gm

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June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #2, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.02	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.2	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.07 gm

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June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #3, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.1	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	<0.01	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	<0.005	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 102.30 gm

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New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #4, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.1	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.008	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.1	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	0.91	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.50 gm

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WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #5, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.04	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	2.6	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	0.48	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	1.5	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 107.50 gm

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WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #6, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.07	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	1.7	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	0.56	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	1.2	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 102.80 gm

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WINK ENGINEERING
New Orleans, Louisiana
May 29, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: #7 HOUMA COMPOSITE

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.09	5.0	0.50/0.48	05-23/VM
Barium (mg/L Ba)	0.7	100	2.50/2.36	05-24/RM
Cadmium (mg/L Cd)	<0.005	1.0	0.250/0.250	05-23/VM
Chromium (mg/L Cr)	0.02	5.0	0.50/0.50	05-24/RM
Lead (mg/L Pb)	0.12	5.0	2.50/2.50	05-24/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0105	05-23/VM
Selenium (mg/L Se)	0.03	1.0	0.050/0.048	05-23/VM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	05-23/VM

Sample Weight: 102.06

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060585-51-53

PRIORITY POLLUTANTS
VOLATILES FRACTIONS

All results in milligrams per kilog

	Duson #1	Duson #2	Duson #3
Benzene	<0.02	<0.02	<0.02
Bromoform	<0.02	<0.02	<0.02
Carbon tetrachloride	<0.02	<0.02	<0.02
Chlorobenzene	<0.02	0.27	<0.02
Chlorodibromomethane	<0.02	<0.02	<0.02
Chloroethane	<0.02	<0.02	<0.02
2-Chloroethylvinyl ether	<0.02	<0.02	<0.02
Chloroform	<0.02	<0.02	<0.02
1,2-Dichlorobenzene	<0.02	<0.02	<0.02
1,4-Dichlorobenzene	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.02	<0.02	<0.02
Dichlorobromomethane	<0.02	<0.02	<0.02
1,1-Dichloroethane	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.02	<0.02	<0.02
1,1-Dichloroethene	<0.02	<0.02	<0.02
trans-1,2-Dichloroethene	<0.02	<0.02	<0.02
1,2-Dichloropropane	<0.02	<0.02	<0.02
cis-1,3-Dichloropropene	<0.02	<0.02	<0.02
trans-1,3-Dichloropropene	<0.02	<0.02	<0.02
Ethylbenzene	0.06	0.65	<0.02
Methylbromide	<0.02	<0.02	<0.02
Methylchloride	<0.02	<0.02	<0.02
Methylene chloride	<0.02	<0.02	<0.02
1,1,2,2-Tetrachloroethane	<0.02	<0.02	<0.02
Tetrachloroethene	<0.02	<0.02	<0.02
Toluene	0.07	0.70	<0.02
1,1,1-Trichloroethane	<0.02	<0.02	<0.02
1,1,2-Trichloroethane	<0.02	<0.02	<0.02
Trichloroethene	<0.02	<0.02	<0.02
Trichlorofluormethane	<0.02	<0.02	<0.02
Vinyl chloride	<0.02	<0.02	<0.02
Total Xylene (semiquantitative)	0.46	6.7	<0.02
Date of Analyses	06-07-85	06-07-85	06-07-85

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Wi ..gineering
New Orleans, Louisiana
060585-54-57

PRIORITY POLLUTANTS
VOLATILES FRACTIONS

All results in milligrams per kilogr

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	~~Houma #1~~	Houma #2	Houma #3	Houma #4
Benzene	<0.02	<0.02	<0.02	<0.02
Bromoform	<0.02	<0.02	<0.02	<0.02
Carbon tetrachloride	<0.02	<0.02	<0.02	<0.02
Chlorobenzene	<0.02	<0.02	<0.02	<0.02
Chlorodibromomethane	<0.02	<0.02	<0.02	<0.02
Chloroethane	<0.02	<0.02	<0.02	<0.02
2-Chloroethylvinyl ether	<0.02	<0.02	<0.02	<0.02
Chloroform	<0.02	<0.02	<0.02	<0.02
1,2-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02
1,4-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02
Dichlorobromomethane	<0.02	<0.02	<0.02	<0.02
1,1-Dichloroethane	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.02	<0.02	<0.02	<0.02
1,1-Dichloroethene	<0.02	<0.02	<0.02	<0.02
trans-1,2-Dichloroethene	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	<0.02	<0.02	<0.02	<0.02
cis-1,3-Dichloropropene	<0.02	<0.02	<0.02	<0.02
trans-1,3-Dichloropropene	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	<0.02	<0.02	<0.02	<0.02
Methylbromide	<0.02	<0.02	<0.02	<0.02
Methylchloride	<0.02	<0.02	<0.02	<0.02
Methylene chloride	<0.02	<0.02	<0.02	<0.02
1,1,2,2-Tetrachloroethane	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.02	<0.02	<0.02	<0.02
Toluene	0.02	<0.02	<0.02	<0.02
1,1,1-Trichloroethane	<0.02	<0.02	<0.02	<0.02
1,1,2-Trichloroethane	<0.02	<0.02	<0.02	<0.02
Trichloroethene	<0.02	<0.02	<0.02	<0.02
Trichlorofluormethane	<0.02	<0.02	<0.02	<0.02
Vinyl chloride	<0.02	<0.02	<0.02	<0.02
Total Xylene (semiquantitative)	<0.02	<0.02	<0.02	<0.02
Date of Analyses	06-07-85	06-07-85	06-07-85	06-07-85

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New Orleans, Louisiana

060785-45-46

PRIORITY POLLUTANTS

VOLATILES FRACTIONS

All results in milligrams per kilogr

ppm

	Houma #5	Houma #6
Benzene	<0.04	<0.04
Bromoform	<0.04	<0.04
Carbon tetrachloride	<0.04	<0.04
Chlorobenzene	[redacted]	[redacted]
Chlorodibromomethane	<0.04	<0.04
Chloroethane	<0.04	<0.04
2-Chloroethylvinyl ether	<0.04	<0.04
Chloroform	<0.04	<0.04
1,2-Dichlorobenzene	<0.04	<0.04
1,4-Dichlorobenzene	<0.04	<0.04
1,3-Dichlorobenzene	<0.04	<0.04
Dichlorobromomethane	<0.04	<0.04
1,1-Dichloroethane	<0.04	<0.04
1,2-Dichloroethane	<0.04	<0.04
1,1-Dichloroethene	<0.04	<0.04
trans-1,2-Dichloroethene	<0.04	<0.04
1,2-Dichloropropane	<0.04	<0.04
cis-1,3-Dichloropropene	<0.04	<0.04
trans-1,3-Dichloropropene	<0.04	<0.04
thylbenzene	[redacted]	[redacted]
Methylbromide	<0.04	<0.04
Methylchloride	<0.04	<0.04
Methylene chloride	<0.04	<0.04
1,1,2,2-Tetrachloroethane	<0.04	<0.04
Tetrachloroethene	<0.04	<0.04
Toluene	[redacted]	[redacted]
1,1,1-Trichloroethane	<0.04	<0.04
1,1,2-Trichloroethane	<0.04	<0.04
Trichloroethene	<0.04	<0.04
Trichlorofluormethane	<0.04	<0.04
Vinyl chloride	<0.04	<0.04
Total Xylene (semiquantitative)	[redacted]	[redacted]
Date of Analyses	06-07-85	06-07-85

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Wink Engineering
New Orleans, Louisiana
052185-45-46

All results in milligrams per kilogram

PRIORITY POLLUTANTS
VOLATILES FRACTIONS

	Houma #7 Composite
Benzene	<0.02
Bromoform	<0.02
Carbon tetrachloride	<0.02
Chlorobenzene	<0.02
Chlorodibromomethane	<0.02
Chloroethane	<0.02
2-Chloroethylvinyl ether	<0.02
Chloroform	<0.02
1,2-Dichlorobenzene	<0.02
1,4-Dichlorobenzene	<0.02
1,3-Dichlorobenzene	<0.02
Dichlorobromomethane	<0.02
1,1-Dichloroethane	<0.02
1,2-Dichloroethane	<0.02
1,1-Dichloroethene	<0.02
trans-1,2-Dichloroethene	<0.02
1,2-Dichloropropane	<0.02
cis-1,3-Dichloropropene	<0.02
trans-1,3-Dichloropropene	<0.02
Ethylbenzene	<0.02
Methylbromide	<0.02
Methylchloride	<0.02
Methylene chloride	<0.02
1,1,2,2-Tetrachloroethane	<0.02
Tetrachloroethene	<0.02
Toluene	<0.02
1,1,1-Trichloroethane	<0.02
1,1,2-Trichloroethane	<0.02
Trichloroethene	<0.02
Trichlorofluormethane	<0.02
Vinyl chloride	<0.02
Total Xylene (semiquantitative)	<0.02
Date of Analyses	05-27-85

REFERENCE 7

~~88-507~~

2101-27

EPA

POTE[...]AL HAZARDOUS WASTE SITE IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 6

SITE NUMBER (to be assigned by Hq): LA01317

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: DELTA SHIPYARD (Formerly a division of Delta Ironworks)

B. STREET (or other identifier): Industrial Blvd.

C. CITY: Houma

D. STATE: LA

E. ZIP CODE: 70360

F. COUNTY NAME: Terrebonne Parish

G. OWNER/OPERATOR (if known)

1. NAME: Ralph Arceneaux, Vice President
2. TELEPHONE NUMBER: (504)868-7450

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION: Repair and cleaning facilities for small cargo and fishing vessels. (See Attachment A)

J. HOW IDENTIFIED (i.e., citizen's complaints, OSHA citations, etc.): Part of the old Delta Iron Works listed on the WAPORA File "D" (Site number LA 01317)

K. DATE IDENTIFIED (mo., day, & yr.): Unknown

L. PRINCIPAL STATE CONTACT

1. NAME: Frank Dautriel, LA Dept. of Nat'l Resources
2. TELEPHONE NUMBER: (504)342-1227

II. PRELIMINARY ASSESSMENT (complete this section last)

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

LAD 058475419

SUPERFUND FILE

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED (no hazard)

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

APR 30 1992

REORGANIZED

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☒ 4. SITE INSPECTION NEEDED (low priority)
SEE ATTACHMENT A.

C. PREPARER INFORMATION

1. NAME: Deborah A. Vaughn *Deborah A. Vaughn*
2. TELEPHONE NUMBER: (214)742-4521
3. DATE (mo., day, & yr.): 3/11/81

REVIEWED BY (CHECK) ... 4/30/81

III. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

☐ 2. INACTIVE (Those sites which no longer receive wastes.)

☐ 3. OTHER (specify): (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

☐ 1. NO ☒ 2. YES (specify generator's four-digit SIC Code): 3731, 3732

C. AREA OF SITE (in acres): Approx. 40

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE (deg.-min.-sec.): 29°34'02" N
2. LONGITUDE (deg.-min.-sec.): 90°42'18" W

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☒ 2. YES (specify): Office, repair shops, storage sheds.

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

(1) Slop oil emulsion solids from the petroleum industry
(2) Tank bottoms (leaded) " " "

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			Could be minimal because of low permeability of soil.
8. CONTAMINATION OF SURFACE WATER	X			Contamination could occur if pits overf
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL	X			Some staining of soils from oily wastes in surface impoundments.
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER (specify):				

ATTACHMENT A

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT SUPPLEMENT SHEET

Instruction - This sheet is provided to give additional information in explanation of a question on the form T2070-2

Corresponding number on form	Additional Remark and/or Explanation
I. i	Delta Ironworks was a large industrial park (approx. 165 acres) located on Industrial Blvd. in southeast Houma, LA. The corporation of Delta Ironworks owned and operated 7 divisions, all located within the Delta Ironworks Industrial facilities. These 7 divisions were: (1) Delta Shipyard - repair and painting of ships. (2) Delta Fabrication - produces offshore oil support equipment (platforms). (3) Delta Construction - produces pipes. (4) Delta Safety & Supply - Distributes safety equipment and constructs fire safety equipment. (5) Heldenbrand - inspection, repair and modification of drill pipes. (6) Delta Mud & Chemical - distributor of drilling muds. (7) Gemoco - construction of offshore oil drill support equipment. In 1969, Delta Ironworks was sold to Chromally American Corp., St. Louis Mo. Chromalloy maintained all 7 divisions until 1980. In November 1980 Chromalloy sold 5 of the divisions to Delta Services Industries, keeping Delta Mud & Chemical and Gemoco. At the present time the old Delta Ironworks (LA01317) area houses the same 7 divisions listed above but has two owners: (1) Delta Services Industries, Houma, LA and (2) Chromalloy American Corp., St. Louis, MO. Upon inspecting the facilities, the FIT representatives found that only Delta Shipyard, owned by Delta Services Industries, may deal with hazardous wastes that could potentially pose a contamination problem. Delta Shipyard consists of cleaning and repair facilities for small cargo and fishing vessels. Before any repair work may commence, the vessels must be certified vapor free by the Coast Guard. The vessels are steamed cleaned and the oily wastes are removed. The generated oils and waste waters are sent through a separation process after which the waste oil is recovered and sold. The waste waters are stored in evaporation ponds (surface impoundments).
II. b. 4	Two monitoring wells have been installed in the vicinity of the surface impoundments (see site sketch). The wells were installed in November 1980 and have not been sampled to date. The FIT recommends sampling of these wells.

ATTACHMENT A

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT SUPPLEMENT SHEET

Instruction - This sheet is provided to give additional information in explanation of a question on the form T2070-2

Page Two - Attachment "A"

Corresponding number on form	Additional Remark and/or Explanation
IV. E	Slop oil and tank bottom oils are removed from the vessels by a high pressure steam cleaning system. Waste residues are then separated and recovered oils are stored in above ground storage tanks before resa Waste waters are stored in surface impoundments and then recycled for the steam cleaning process.

DELTA SHIPYARD

TOP CUSTOMERS

9/18/80

Account 2 (Shipyard Operations)

Canal Barge Co., Inc.
835 Union St.
New Orleans, LA 70112
(James O. Gundlach, V.P.)

Ashland Petroleum Co.
P. O. Box 391 (1401 Winchester Ave.)
Ashland, Ky 41101
(Bob Gray, Mgr. Marine Serv.)

Cenac Towing Co.
Foot of Palm Avenue
Houma, LA
(Clark Cenac)

Sabine Towing & Transportation Co., Inc.
P. O. Box 1528
Groves, TX 77619
(Craig Stevenson/K. C. Smith)

Seacoast Products, Inc.
Port Monmoth, N. J.
(201) 787-1000
(Bryan Harris-Engineering, etc.)

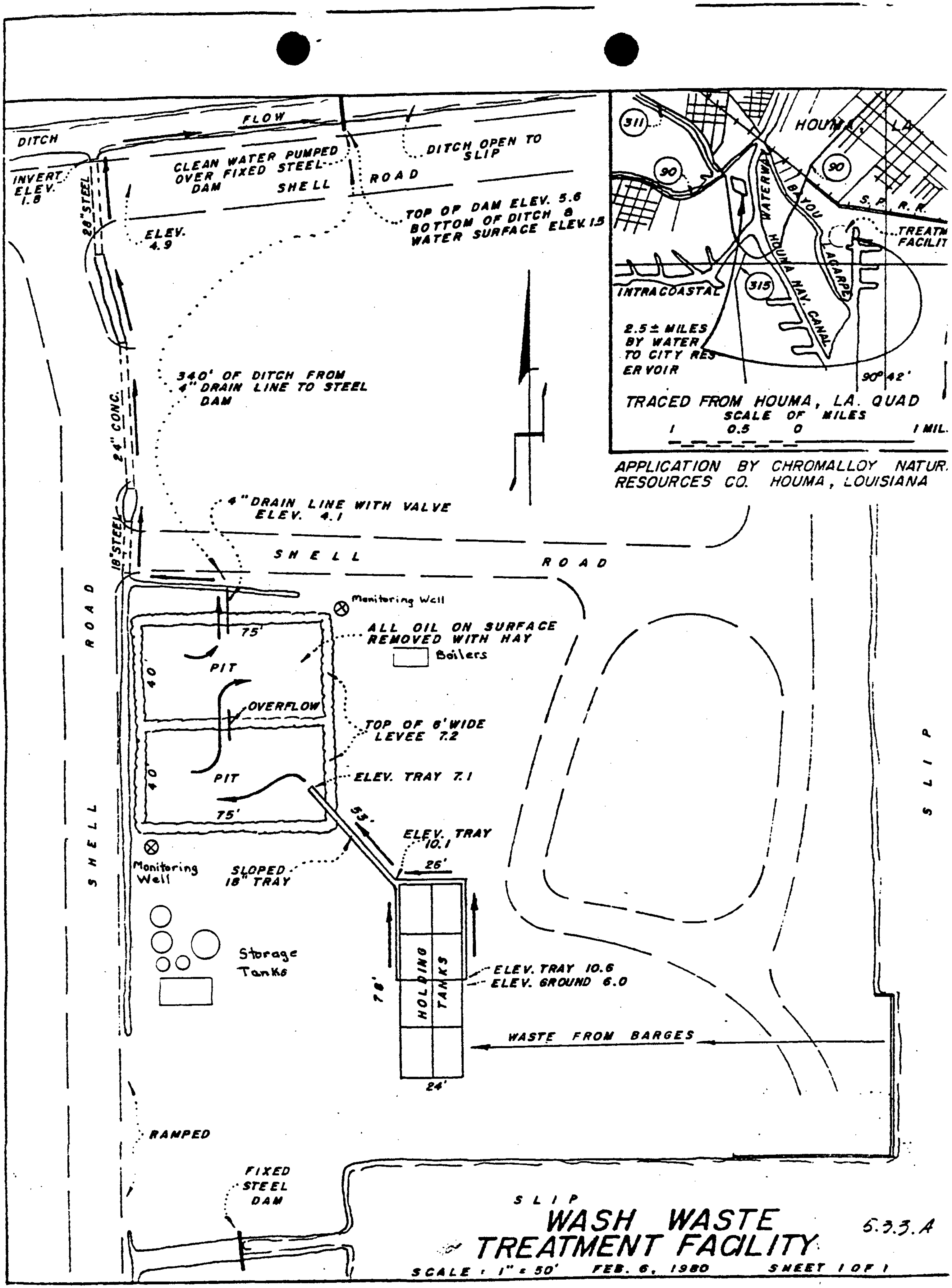
Morton Chemical Co.
P. O. Box 280 (Weeks Island)
New Iberia, LA 70560
(Nelson Stelly-Marine Supt.)

Texaco, Inc. (Marketing Dept.)
P. O. Box 1028 (Texaco Island)
Port Arthur, TX 77640
(Dennis Scoog) - also:
Texaco Production Dept.
Van Ave. - Houma

Dixie Carriers, Inc.
P. O. Box 248 (2266 Peters Road)
Harvey, LA 70059
(Tony Blanchard)

Zapata Haynie Corp.
Dulac, LA
(Charles Rice, Maint.)

ATTACHMENT B


DITCH
FLOW
INVERT ELEV. 1.8
CLEAN WATER PUMPED OVER FIXED STEEL DAM
SHELL ROAD
DITCH OPEN TO SLIP
TOP OF DAM ELEV. 5.6
BOTTOM OF DITCH & WATER SURFACE ELEV. 1.5
ELEV. 4.9
28" STEEL
24" CONC.
18" STEEL
340' OF DITCH FROM 4" DRAIN LINE TO STEEL DAM
4" DRAIN LINE WITH VALVE ELEV. 4.1
SHELL ROAD
SHELL ROAD
Monitoring Well
ALL OIL ON SURFACE REMOVED WITH HAY
Boilers
75'
40
PIT
OVERFLOW
TOP OF 6' WIDE LEVEE 7.2
40
PIT
ELEV. TRAY 7.1
75'
53'
ELEV. TRAY 10.1
26'
Monitoring Well
SLOPED 18" TRAY
Storage Tanks
HOLDING TANKS
78'
ELEV. TRAY 10.6
ELEV. GROUND 6.0
WASTE FROM BARGES
24'
SLIP
RAMPED
FIXED STEEL DAM
SLIP
311
90
90
HOUMA, LA.
S.P. R.R.
WATERWAY
BAYOU LACARPE
HOUMA NAV. CANAL
TREATMENT FACILITY
INTRACOASTAL
315
2.5± MILES BY WATER TO CITY RESERVOIR
90°42'
TRACED FROM HOUMA, LA. QUAD
SCALE OF MILES
1 0.5 0 1 MIL.
APPLICATION BY CHROMALLOY NATUR. RESOURCES CO. HOUMA, LOUISIANA
WASH WASTE TREATMENT FACILITY
5.3.3.A
SCALE: 1" = 50' FEB. 6, 1980 SHEET 1 OF 1

1. COST CENTER	TECHNICAL DIRECTION DOCUMENT (TDD)	2.
EP152-6	UNCON LED HAZARDOUS WASTE SITE PROJE **ecology and environment, inc.**	No. F-6-8101-07

3. Priority:	4. Authorized Overtime	5. EPA Site Identification Number	6. Completion Date:	7. Reference Info:
☐ High ☐ Medium ☑ Low	☐ Yes ☑ No	LA01317	3-31-81	☑ Yes ☐ No ☑ Attached ☐ Pick Up

8. General Task Description: Conduct reconnaissance inspection at Delta Iron Works, Industrial Blvd. in Houma, Louisiana. Collect samples of any runoff / leachate from site.

9. Specific Elements:	10. Interim Deadlines
FIT representative must: - notify appropriate state agencies & facility representative - complete PA - complete T2070-3 with applicable supplemental forms, if necessary - indicate necessity & priority of on-site sampling inspection & suggest locations for sampling - photograph to document site conditions - immediately notify DPO of Ø311 violations	

11. Desired Report Form: Formal Report ☑ Letter Report ☐ Formal Briefing ☐

Other (Specify): SUPERFUND FILE APR 30 1992 REORGANIZED

12. COMMENTS: Delta Shipyard LAD 058475419

13. Authorizing DPO:	14. Date:
Charles A. Gazda (Signature)	1/12/81

15. Received By: ☒ Accepted ☐ Accepted with exceptions ☐ Rejected	16. Date:
K. D. Malone (FITL Signature)	1/15/81

Exceptions Comments From (15)

Sheet 1 White — FITL Copy
Sheet 2 Canary — DPO Copy
Sheet 3 Pink — Contracting Officer's Copy (Washington, D. C.)
Sheet 4 Goldenrod — Project Officer's Copy (Washington, D. C.)
☐ Photocopy to E & E NPM (Washington, D. C.)

REFERENCE 8

~~88508~~

APPENDIX F

PRELIMINARY

REPORT OF

SOIL BORINGS
AND
LABORATORY TESTING

DELTA SHIPYARD DISPOSAL PIT
HOUMA, LOUISIANA

FOR

T. BAKER SMITH & SONS, INC.
ENVIRONMENTAL RESEARCH DIVISION
HOUMA, LOUISIANA

ENGINEERING SERVICES
BY

SOIL TESTING ENGINEERS, INC.

CONSULTANTS IN SOIL ENGINEERING AND FOUNDATION ANALYSIS

BATON ROUGE & LAKE CHARLES, LOUISIANA

SOIL TESTING ENGINEERS, INC.

CONSULTING GEOTECHNICAL ENGINEERS

P O BOX 80379 • 316 HIGHLANDIA DRIVE • BATON ROUGE, LOUISIANA 70808 • PHONE (504) 292-4790

GORDON P. BOUTWELL, JR PHD
RICHARD B ADAMS, ME
ROBERT L. BRYANT, ME
R. KENNETH DERICK, MS
REGISTERED PROFESSIONAL ENGINEERS

DAN A BROWN, MS

November 26, 1980

T. Baker Smith and Sons, Inc.
Environmental Research Division
P. O. Box 2266
Houma, Louisiana 70361

Attention: Mr. Horace J. Thibodaux, RS
Director of Environmental Research

Re: Preliminary Soil Borings
and Laboratory Testing
Delta Shipyard Disposal Pit
Houma, Louisiana
File: 80-173

Gentlemen:

We have completed the field work and laboratory tests performed on samples obtained from two borings completed during the period November 3 and 4, 1980, at the Delta Shipyard disposal pit. Additionally, two observation wells with caps, were installed close to the borings (see Figure 2). The findings of the borings and the results of the laboratory testing are presented herein. The approximate locations of the borings are shown on the Boring Plan, Figure 1. The soil data on this cross section has been interpolated between the borehole locations and does not define continuity of the strata. For details, refer to the individual logs of the borings. The field and laboratory procedures used in this investigation are discussed below.

It should be noted that a geotechnical/geologic report was not requested at this stage. If such a report is later required, then necessary additional borings and testing, as well as engineering analyses can be performed.

FIELD EXPLORATION

General. The borings were made with tractor-mounted, rotary-type drilling equipment. Samples were obtained continuously in the upper 20 feet; below the 20 foot level, samples were generally obtained on 3 to 5 foot centers. The total exploration program consisted of 100 lineal feet of borings, 40 feet of which were sampled continuously. Logs of the borings are attached. The boreholes were grouted with a thick bentonite/cement grout. Two observation wells were installed as indicated on the Monitoring Well logs (W-1 and W-2) and Figure 1.

Sampling Procedures. In the cohesive and semi-cohesive soils, relatively undisturbed samples were secured using a 3 inch diameter, thin-wall Shelby Tube sampler. In this sampling procedure, the borehole is advanced to the desired level, and the tube is lowered to the bottom of the boring. It is then forced about 2 feet into the undisturbed soil in one continuous stroke. The tube is retrieved and the sample extruded by a hydraulic piston. The sample is then visually classified and a penetrometer relative strength test performed. Any disturbed portions are discarded, and the sample protected for transportation to the laboratory.

LABORATORY PROCEDURES

Some samples from the various strata were tested in the laboratory to determine their classifications and permeability characteristics. The samples and types of tests performed were selected by a geotechnical engineer. The testing program conducted is described below.

Classification Tests. Thirteen (13) Atterberg Limit Determinations, and one Separate Moisture Content Determination were conducted to classify the soil types.

Consolidation/Permeability Tests. Two (2) Standard Consolidation tests were performed. These were used in determining the Coefficient of Permeability of fine grained soils. The results are given below.

Boring No.	Depth (feet)	Perm. Coef. (cm/sec.)	Soil Description
B-1	6-8	4.3×10^{-8}	Gray organic clay
B-2	12-14	1.2×10^{-7}	Dark gray organic clay (peat)

Chemical Tests. Fourteen (14) pH determinations were performed to determine soil acidity/alkalinity. The results are give on Table I.

The results of the consolidation test are presented on Figure A-I through A-II; the remainder of the testing program is summarized in the appropriate columns of the boring logs.

We will be happy to answer any questions which may arise concerning this information. It has been a pleasure to work with Mr. Thibodaux on this project, and we look forward to serving T. Baker Smith and Sons again in the future.

Sincerely,

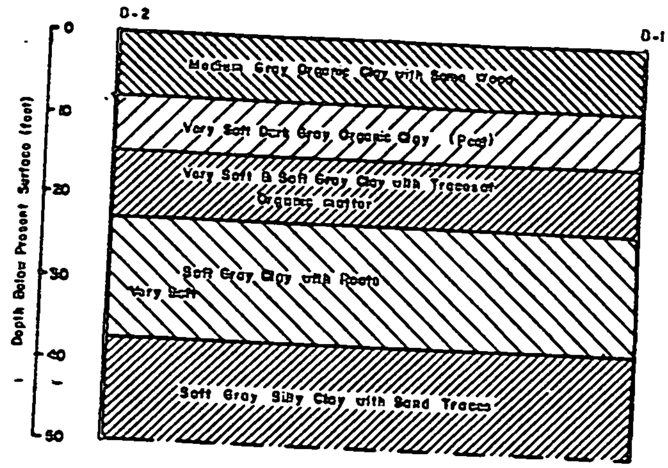
Narendra Dave
Narendra M. Dave
Project Engineer

R B Adams
Richard B. Adams, P.E.

/llt

Enclosures

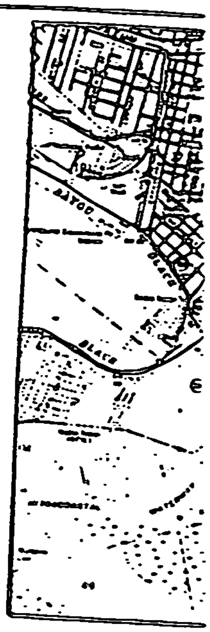
Copies submitted: (4)

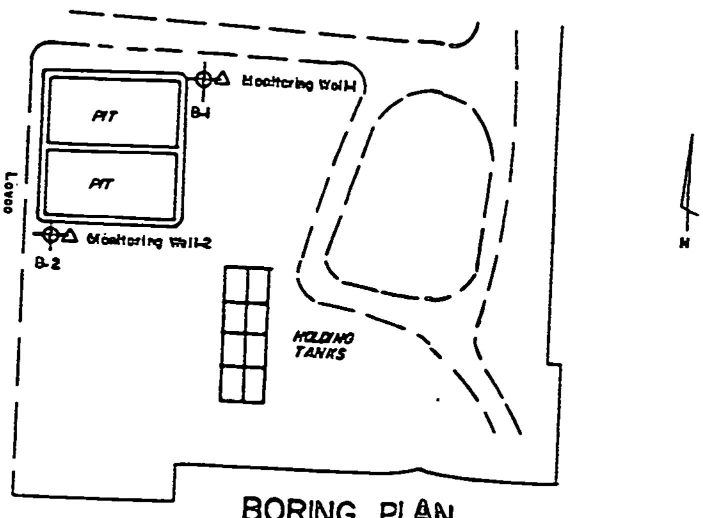


SOIL PROFILE

No Horiz. Scale

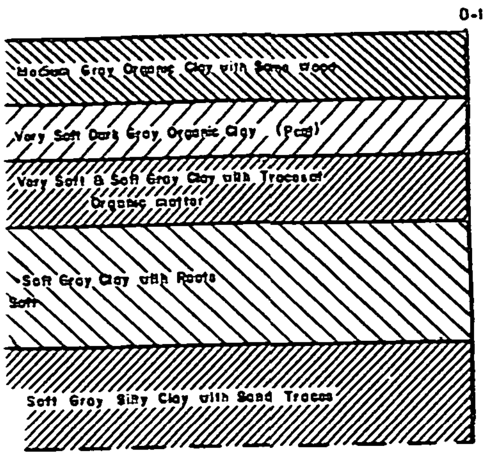
NOTE:
Strata interpolated between borehole locations and do not define continuity between them.





BORING PLAN

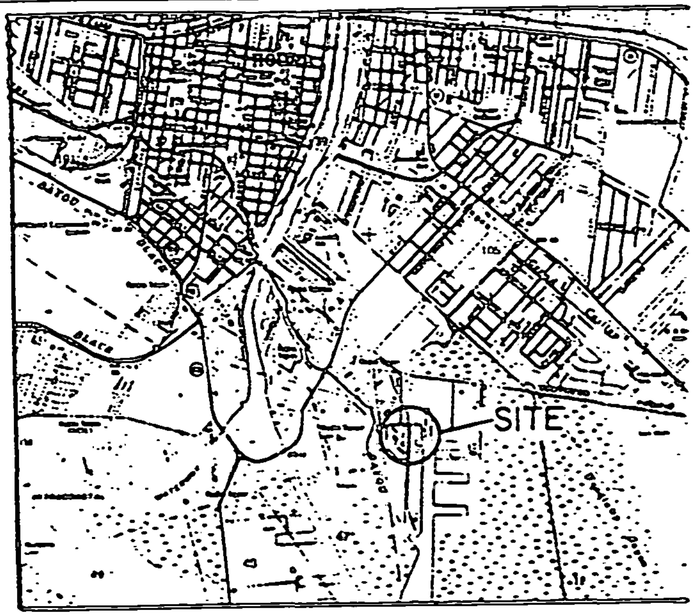
No Scale



SOIL PROFILE

No Horiz. Scale

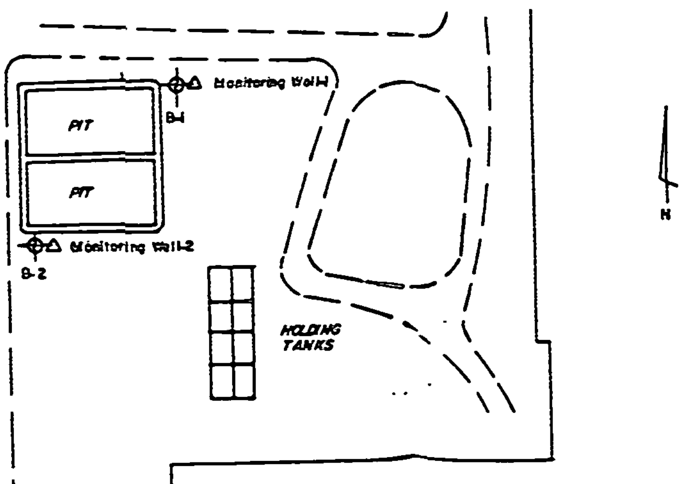
NOTE:
Strata interpolated between borehole locations and do not define continuity between them.



Ref: USC & GS Quad. Map
Houma, Louisiana

VICINITY MAP

0 miles 1
Scale



BORING PLAN

WASTE FACILITY Houma, Louisiana
for DELTA SHIPYARD Houma, Louisiana
T. BAKER SMITH & SON INC ENVIROMENTAL RESEARCH DIV Houma, Louisiana
SOIL INVESTIGATION BY SOIL TESTING ENGINEER Baton Rouge, La

FILE NO	DATE	BY	CHK
80-173	11/24/80	R A K	H M D

Alternate No. 1

1. Laboratory personnel shall train Delta Shipyard personnel as to the proper collection technique concerning sample collection and in accord with the Department of Natural Resources "Analytical Operating Procedures Manual" Provisional Edition dated August 5, 1980.
2. Same as No. 2 on sheet 1 of 3.
3. Same as No. 3 on sheet 2 of 3.

iron, mg/liter

lead, mg/liter

magnesium, mg/liter

maganese, mg/liter

mercury, mg/liter

nickel, mg/liter

selenium, mg/liter

silver, mg/liter

thalium, mg/liter

vanadium, mg/liter

zinc, mg/liter

k. ammonia (as N), mg/liter

l. chlorides, mg/liter

m. cyanide, mg/liter

n. fluoride, mg/liter

o. nitrate, mg/liter

p. phosphage, total mg/liter

r. ortho-phosphate (as P), mg/liter

s. organic contaminant scanning (volatile, base neutrals, acid extracts) by Gas Chromatography

3. A report of the analysis of samples will be submitted to Delta Shipyard, Inc. Attention: Mr. Chris Olivier, P.O. Box 101, Houma, Louisiana 70361. An estimated time for submitting the report after sample collection shall accompany the estimate.

PROPOSED SCOPE OF WORK

1. Laboratory personnel will collect comprehensive operational samples from each of the existing monitoring wells shown in Exhibit "A" attached. The samples will be collected on a quarterly basis for a period of one year. A schedule of collection dates shall accompany your estimate.

2. Once the samples are collected in accord with the Department of Natural Resources, Office of Environmental, Hazardous Waste Management Division, "Analytical Operating Procedures Manual" Provisional Edition dated August 5, 1980, the laboraty analyses from each monitoring well will include the identification of the presence and level of the following paramete

   a. specific conductivity, mho/cm at 25°C
   b. temperature, C (field and laboratory)
   c. pH
   d. total dissolved solids, mg/liter
   e. total suspended solids, mg/liter
   f. total settleable solids, mg/liter
   g. dissolved organic carbon (DOC), mg/liter
   h. total chlorinated hydrocarbons, mg/liter
   i. phenolic compounds (as phenol), mg/liter
   j. metals:

      antimony, mg/liter

      arsenic, mg/liter

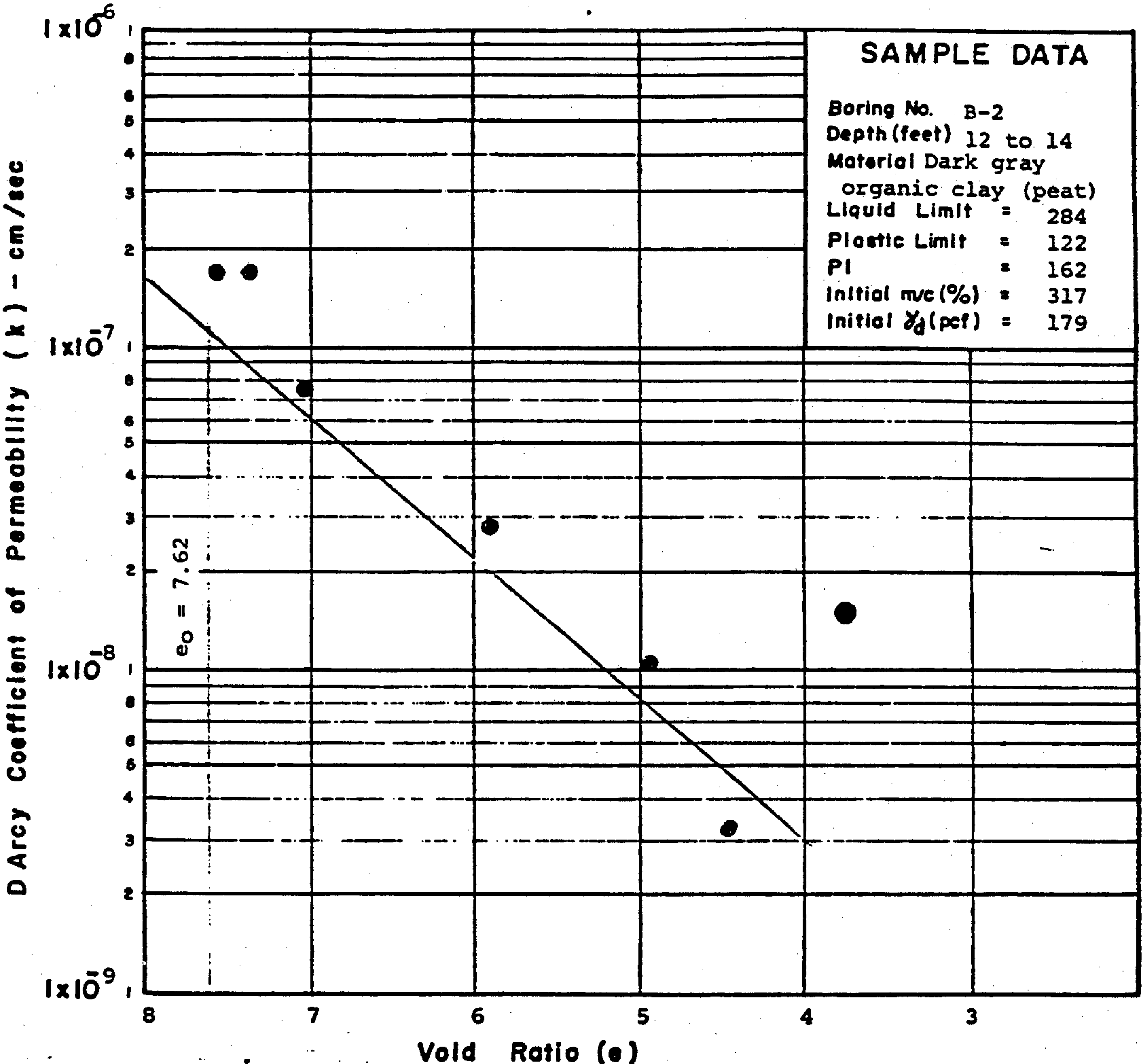
      barium, mg/liter

      beryllium, mg/liter

      cadmium, mg/liter

      chromium, mg/liter

      copper, mg/liter



$$k = C_v \gamma_w \frac{\Delta e / \Delta \sigma}{1 + e_o}$$

● Raw Data Point

—— Best Fit Linear Regression in Stable Range

C_v = Coeff. of Consolidation
Δe = Change in Void Ratio
$\Delta \sigma$ = Change in Pressure
γ_w = Unit Weight of Water

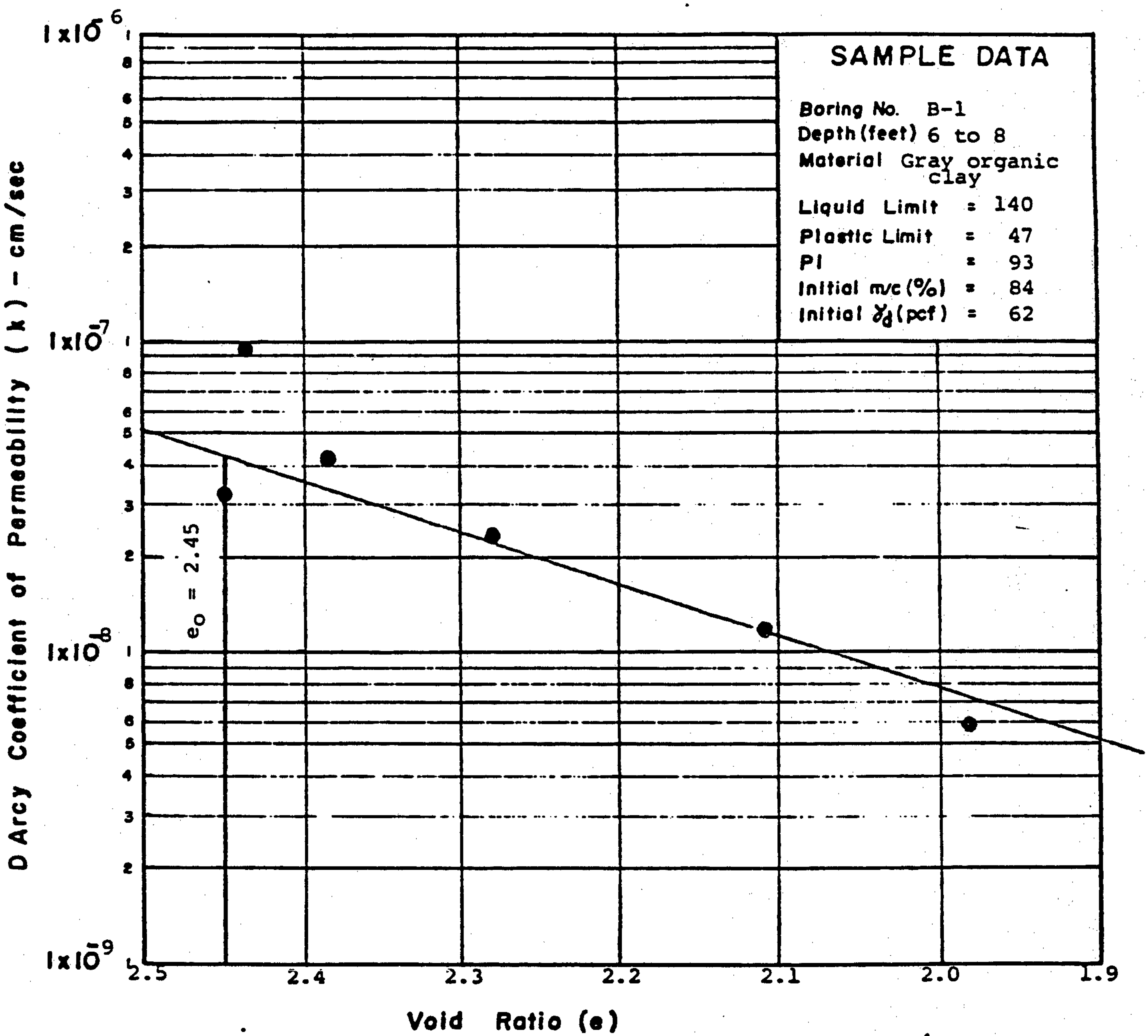
$k = 1.2 \times 10^{-7}$ cm/sec at $e_o = 7.62$

PERMEABILITY DETERMINED BY CONSOLIDATION TEST

Delta Shipyard Disposal Pit
Houma, Louisiana

80-173
Figure A-IIB

SOIL TESTING ENGINEERS, INC.



$$k = C_v \gamma_w \frac{\Delta e / \Delta \sigma}{1 + e_o}$$

● Raw Data Point

—— Best Fit Linear Regression in Stable Range

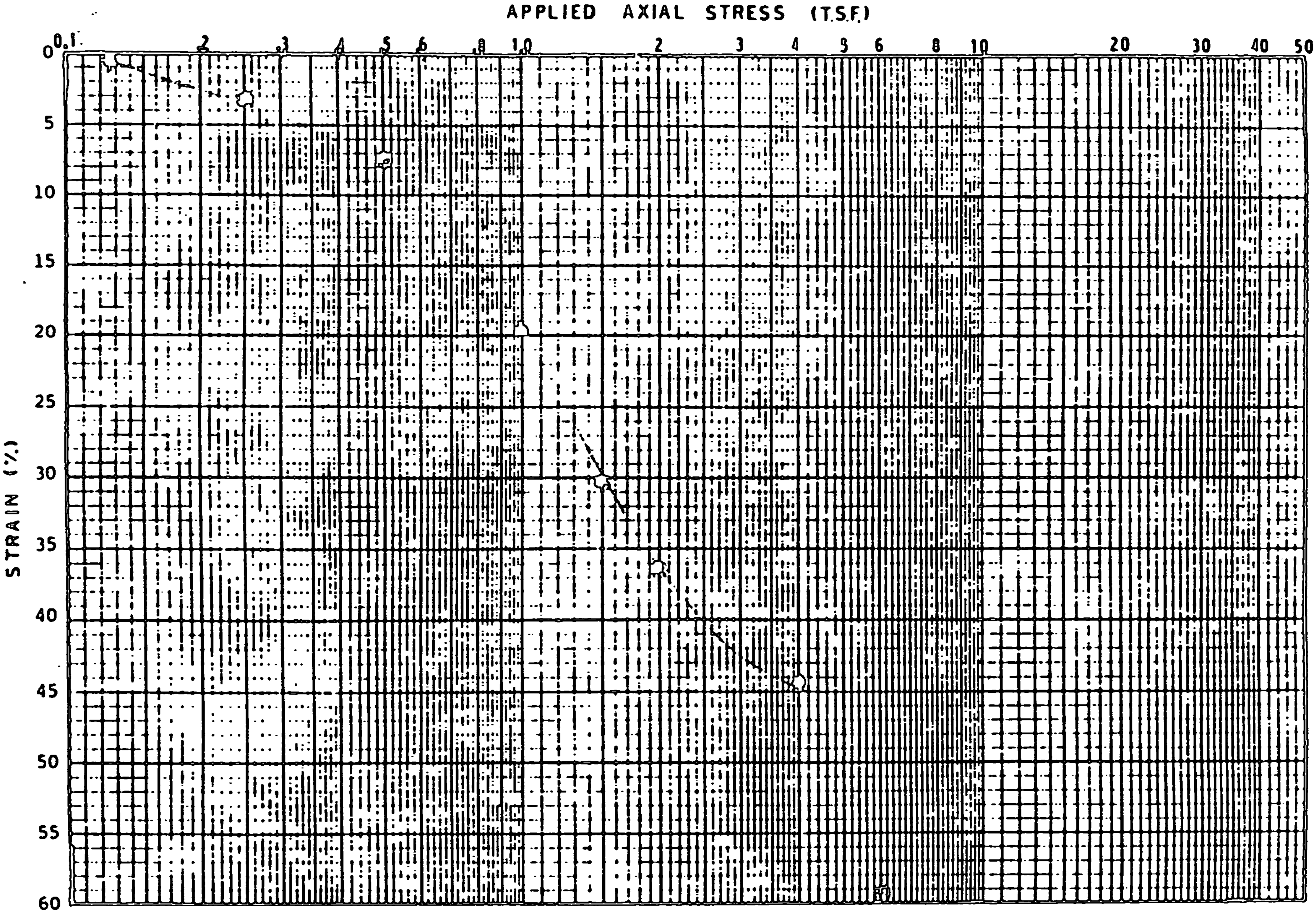
C_v = Coeff. of Consolidation
Δe = Change in Void Ratio
$\Delta \sigma$ = Change in Pressure
γ_w = Unit Weight of Water

$k = 4.3 \times 10^{-8}$ cm/sec at e_o = 2.45

PERMEABILITY DETERMINED BY CONSOLIDATION TEST

Delta Shipyard Disposal Pit
Houma, Louisiana

80-173
Figure A-IB



CONSOLIDATION TEST

SAMPLE IDENTIFICATION

Boring No. : B-2
Depth (ft) : 12 to 14
Material : Dark gray organic clay (peat)

CLASSIFICATION DATA

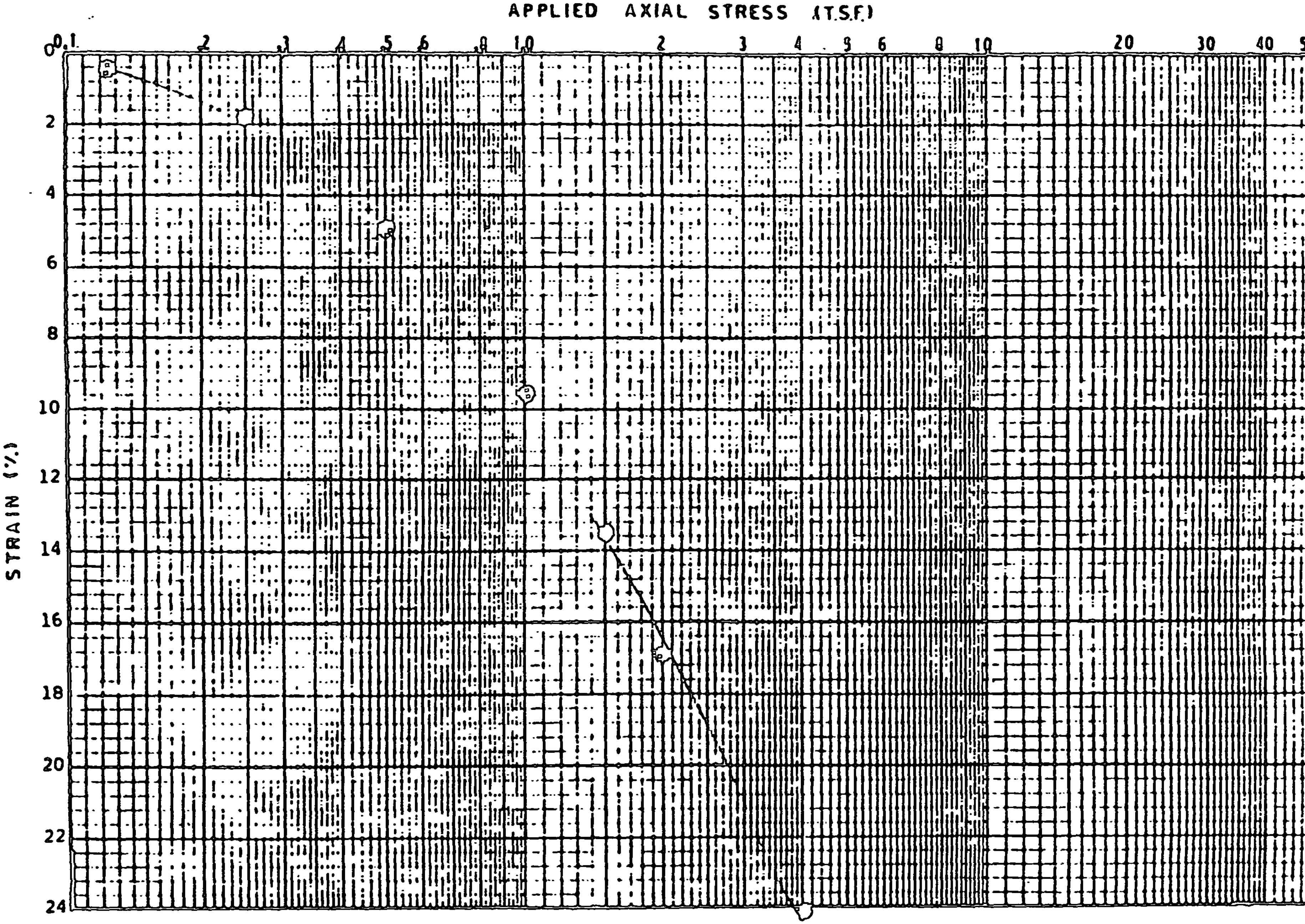
Initial Moisture Content (%) = 317
Initial Dry Density (lbs./cu.ft) =
Final Moisture Content (%) = 179

LL = 284
PL = 122
PI = 162

SOIL TESTING ENGINEERS, INC.

FILE NO. 80-173

FIGURE NO. A-IIA



CONSOLIDATION TEST

SAMPLE IDENTIFICATION
Boring No. : B-1
Depth (ft) : 6 to 8
Material : Gray organic clay

CLASSIFICATION DATA
Initial Moisture Content (%) = 84
Initial Dry Density (lbs./cu.ft.) =
Final Moisture Content (%) = 62

LL = 140
PL = 47
PI = 93

SOIL TESTING ENGINEERS, INC.

FILE NO.

FIGURE NO A-IA

TABLE I

CHEMICAL ANALYSIS

Boring No.	Depth (feet)	pH
1	2.0 to 4	7.3
1	6.0 to 8	7.9
1	10.0 to 12	5.9
1	16.0 to 18	7.3
1	28.0 to 30	8.2
1	38.0 to 40	8.1
2	0 to 2	6.8
2	4.0 to 6	7.7
2	8.0 to 10	7.5
2	12.0 to 14	6.3
2	18.0 to 20	8.0
2	33.0 to 35	8.0
2	43.0 to 45	8.0

MONITORING WELL LOG
Boring No. W-2

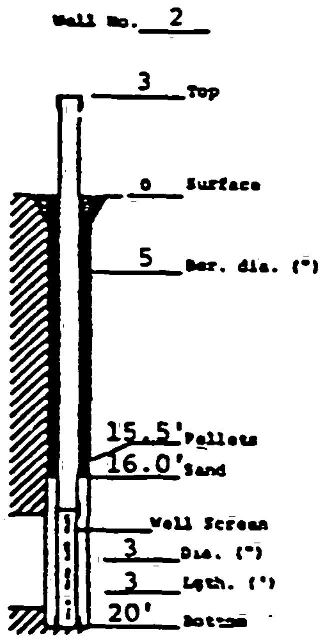
Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

File No. 80-173
Date 11/04/80
By Chenevert

FIELD DATA			Boring Advance Method:	
	DEPTH (feet)		Wash 0' to 20'	Drill Rig: 200 Driller: James Kelly
	5		SEE BORING B-2	
	10			
	15			
	20		Boring terminated @ 20'	

Monitoring Well Data



Standard Penetration Test

Undisturbed Sample

No Recovery

SOIL TESTING ENGINEERS, INC.

MONITORING WELL LOG

Boring No. W-1

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

File No. 80-173
Date 11/03/80
By Chenevert

FIELD DATA

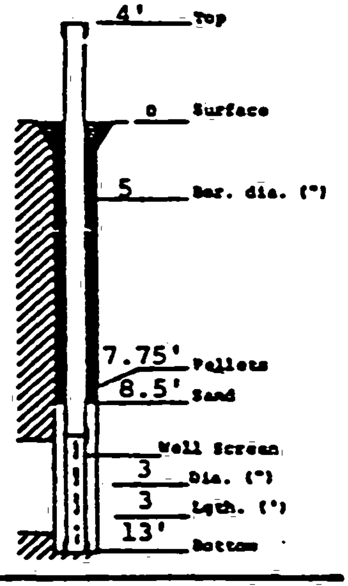
Boring Advance Method:
Wash 0' to 12'

Drill Rig: 200
Driller: James Kelly

Water Levels	DEPTH (feet)	Samples	Standard Penetration Test (blows/foot) or Penetrometer (P) - Torvane (T) (tons/sq ft)	Description
	5			SEE BORING B-1
	10			
				Boring terminated @ 12'

Monitoring Well Data

Well no. 1



Standard Penetration Test 140 lb hammer - 30 in fall

Undisturbed Sample 3 in OD Shelby Tube

No Recovery

Strata boundaries inferred and may not be exact

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project: Delta Disposal Pit
Houma, Louisiana

Boring No. B-2

File No. 80-173

Client: T. Baker Smith & Sons, Inc.
Houma, Louisiana

Sheet 2 of 2

Date 11/04/80

Tech. Chenevert

FIELD DATA				LABORATORY DATA					
Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer(P) (tons/sq.ft)	Compressive Strength (tons/sq.ft.)	Moisture Content (%)	Dry Density (lbs./cu.ft.)	Liquid Limit (%)	Plasticity Index (%)	
									Soft gray silty clay, w/sand traces
	45		0.3 (P)		32		35	9	
	50		0.7 (P)						
									Boring terminated @ 50'

SYMBOL

Standard Penetration Test
140 lb. hammer-30" fall

Undisturbed Sample
3 in. dia. Shelby Tube

No Recovery

Compressive Strength from Unconfined Compression Test
Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project: Delta Disposal P
Houma, Louisiana

Client: T. Baker Smith & Sons, Inc.
Houma, Louisiana

Boring No. B-2

Sheet 1 of 2

File No. 80-173

Date 11/04/80

Tech. A. Kahn

Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq.ft)	Compressive Strength (tons/sq.ft.)	Moisture Content (%)	Dry Density (lbs./cu.ft.)	Liquid Limit (%)	Plasticity Index (%)	Boring Advance Method: Auger 0' to 2' Wash 2' to 50'
∇ ∇			1.2 (P)		41		107	68	Medium gray organic clay, w/some wood
			0.7 (P)		54		101	54	
	5		0.6 (P)						
			N.P.						
	10		0.3 (P)		131		154	107	Very soft dark gray organic clay (peat)
			0.3 (P)						
			0.4 (P)		110		284	162	
	15		0.5 (P)						Soft gray clay, w/traces of organic matter
			0.2 (P)						
	20		1.2 (P)		39		88	60	
	25		0.5 (P)						Soft gray clay, w/wood & roots
	30		0.4 (P)						
	35		0.1 (P)		35		63	38	--very soft
	40		0.3 (P)						Soft gray silty clay, w/sand traces

SYMBOL

Standard Penetration Test 140 lb. hammer - 30" fall

Undisturbed Sample 3 in. dia. Shelby Tube

No Recovery

∇ Free Water First Encountered

∇ Water Level After 10 minutes (Prior to Wash Boring)

Compressive Strength from Unconfined Compression Test Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project: Delta Disposal Pi[illegible]
Houma, Louisiana

Boring No. B-1

Sheet 2 of 2

File No. 80-173

Date 11/03/80

Tech. Chenevert

Client: T. Baker Smith & Sons, Inc.
Houma, Louisiana

FIELD DATA				LABORATORY DATA					
Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq. ft)	Compressive Strength (tons/sq. ft.)	Moisture Content (%)	Dry Density (lbs./cu. ft.)	Liquid Limit (%)	Plasticity Index (%)	
									Soft gray silty clay, w/sand traces
	45		0.6 (P)						
	50		0.5 (P)		38		38	14	
									Boring terminated @ 50'

SYMBOL

Standard Penetration Test 140 lb. hammer - 30" fall

Undisturbed Sample 3 in. dia. Shelby Tube

No Recovery

Compressive Strength from Unconfined Compression Test Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project Delta Disposal Pit
Houma, Louisiana

Boring No. B-1

Sheet 1 of 2

File No. 80-173

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

Date 11/03/80

Tech. Chenevert

FIELD DATA				LABORATORY DATA					Boring Advance Method:
Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq.ft)	Compressive Strength (tons/sq.ft.)	Moisture Content (%)	Dry Density (lbs/cu.ft.)	Liquid Limit (%)	Plasticity Index (%)	Wash 0' to 50'
			1.2 (P)						Medium gray organic clay, w/wood
			0.8 (P)		52		102	74	
	5		0.7 (P)						
			0.5 (P)		78		140	93	
			N.P.						Very soft dark gray organic clay (peat)
	10		0.1 (P)		140		218	135	
			0.1 (P)						
	15		0.5 (P)						Very soft gray clay, w/traces of organic matter
			0.2 (P)		37		66	37	
	20		0.7 (P)						
	25		0.6 (P)						Soft gray clay, w/roots
	30		0.1 (P)		50		77	42	--very soft
	35		0.0 (P)						
	40		1.1 (P)		31				Medium gray silty clay, w/sand traces

SYMBOL

Standard Penetration Test
140 lb. hammer-30" fall

Undisturbed Sample
3in. dia. Shelby Tube

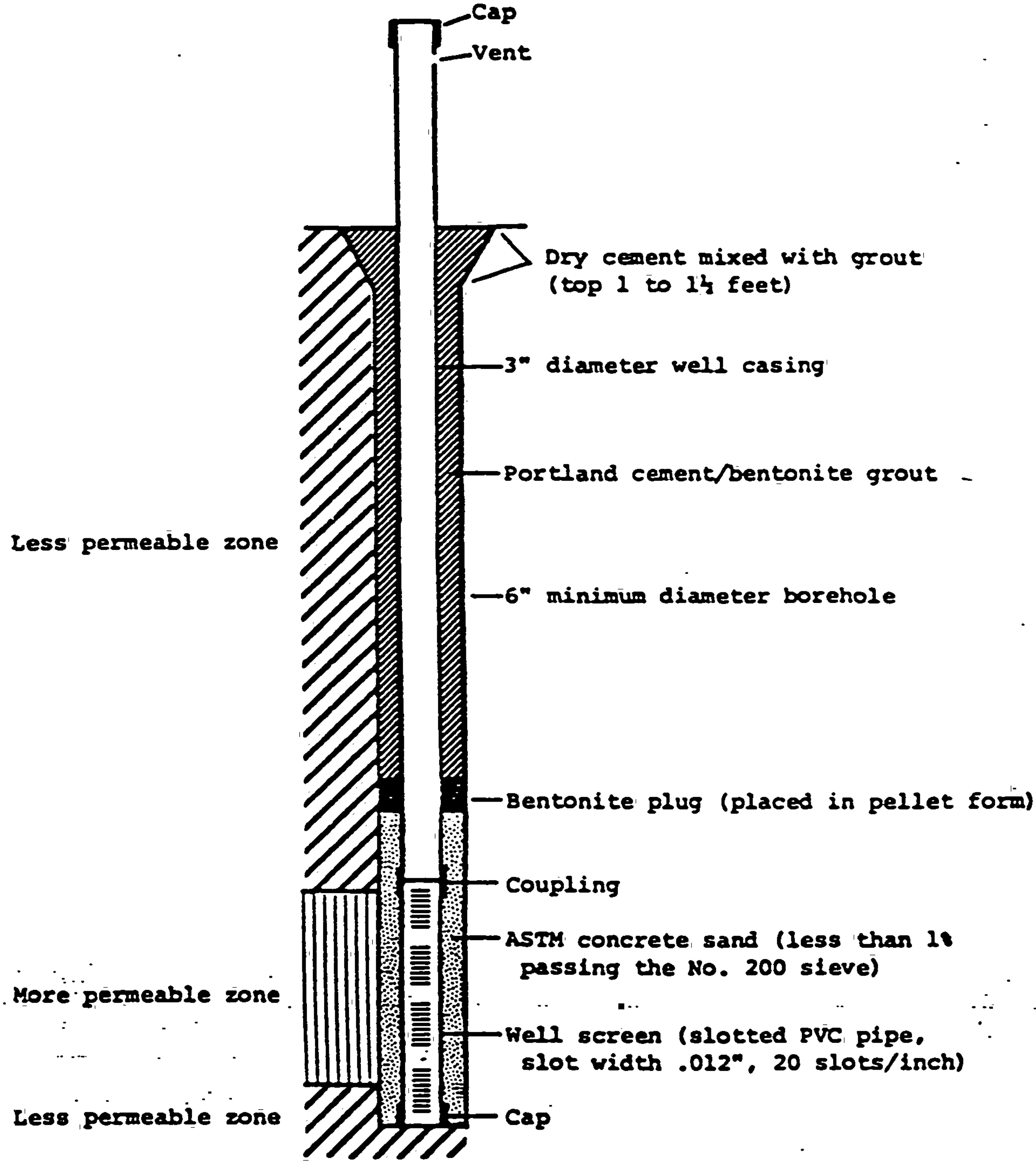
No Recovery

Compressive Strength from Unconfined Compression Test
Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

SOIL TESTING ENGINEERS, INC.

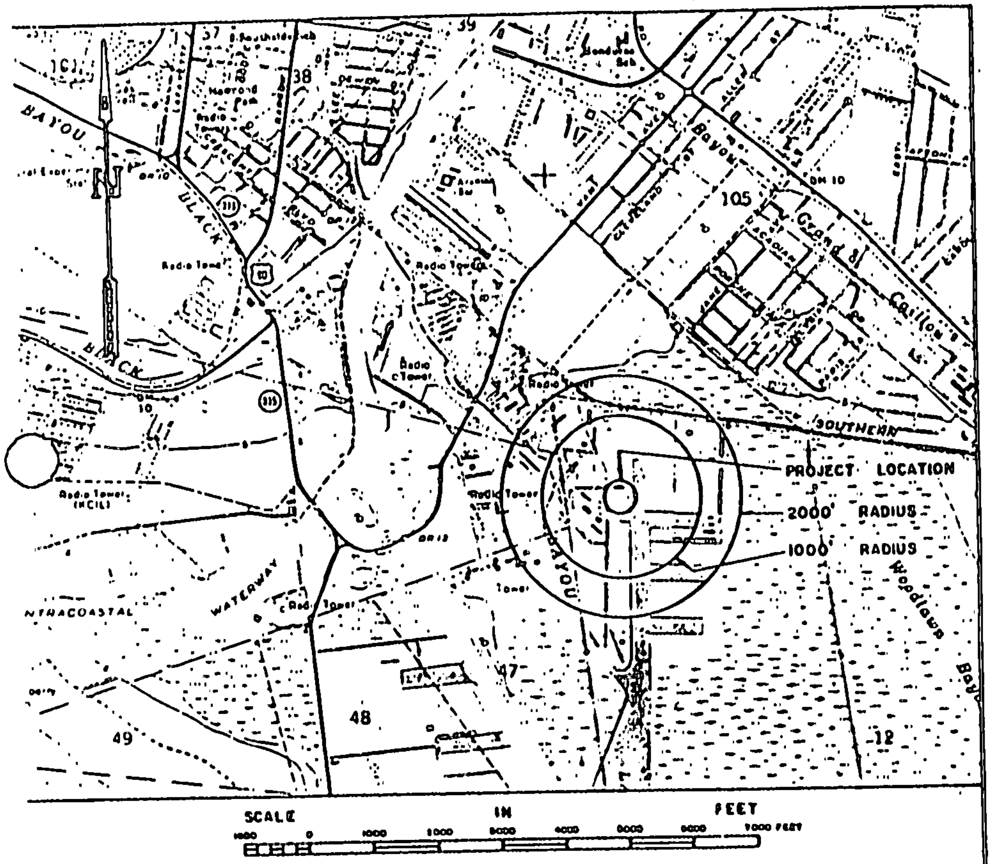


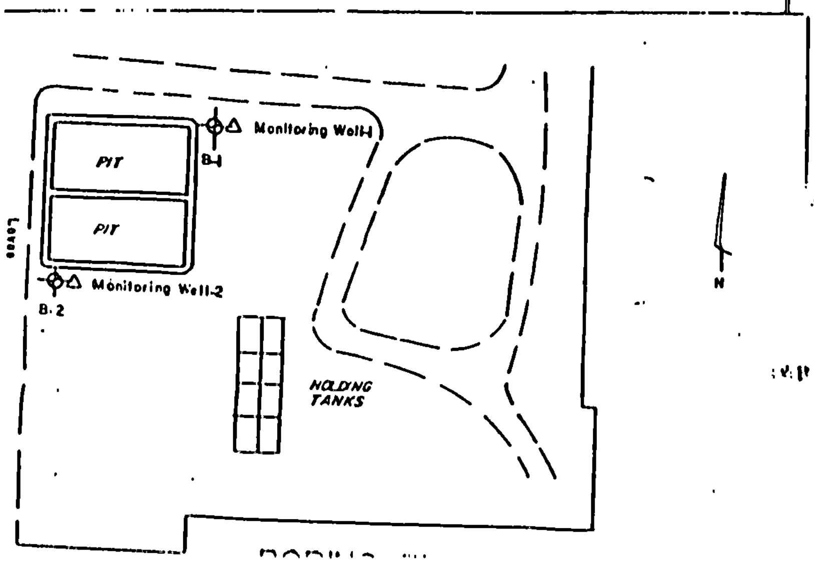
TYPICAL MONITORING WELL SECTION

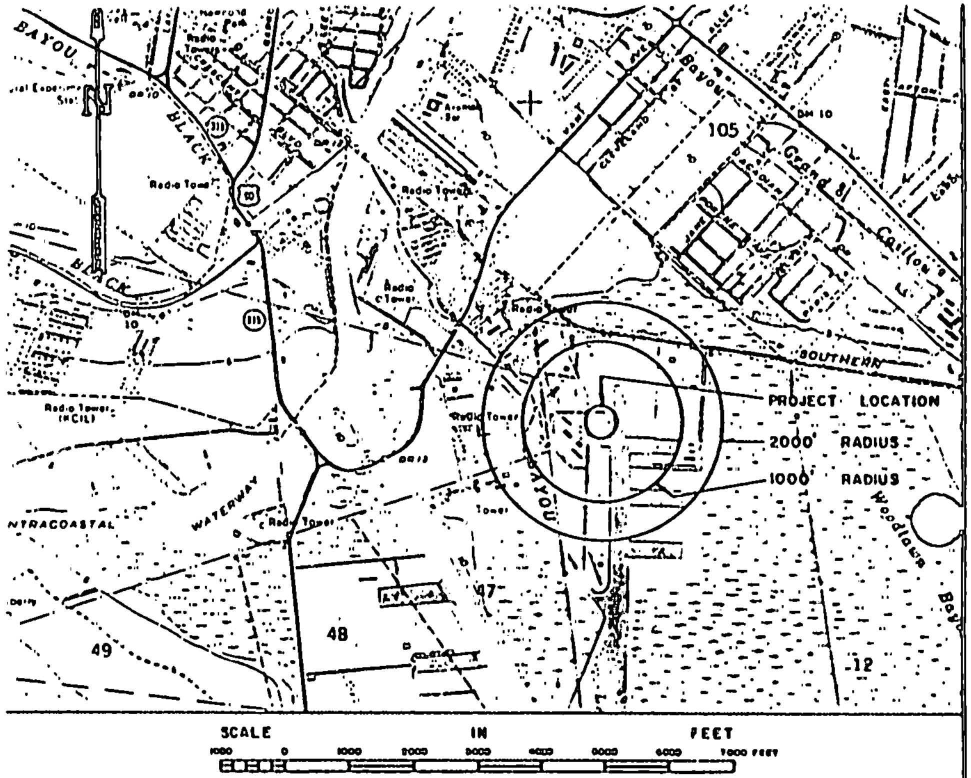
Delta Shipyard Disposal Pit
Houma, Louisiana

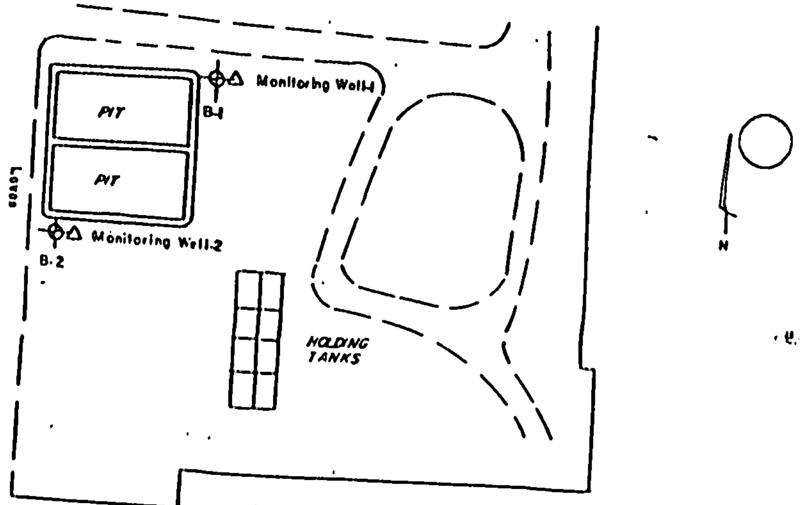
80-173
Figure 2

EXHIBIT "A"


PROJECT LOCATION
2000' RADIUS
1000' RADIUS
SOUTHERN
BAYOU
BLACK
Grand Caillou
INTRACOASTAL
WATERWAY
Radio Tower
SCALE IN FEET
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET


PIT
PIT
Monitoring Well-1
B-1
Monitoring Well-2
B-2
HOLDING TANKS
N

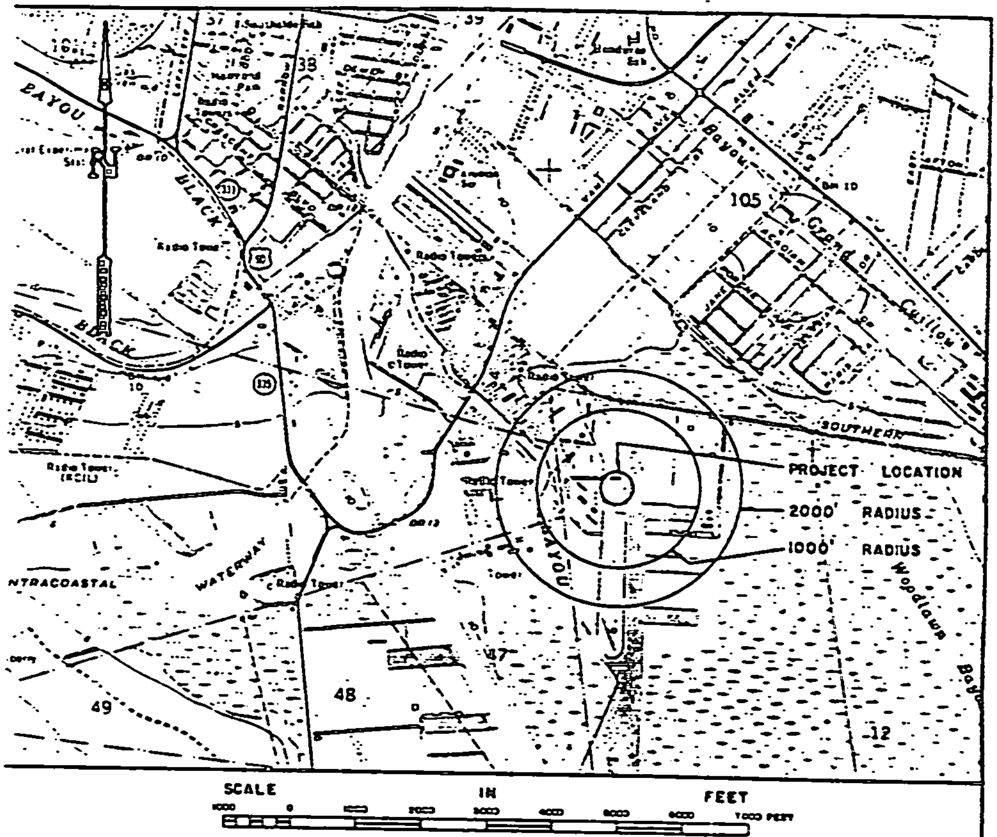




BORING PLAN

No Scale

EXHIBI "



BAYOU
BLACK
NTRACOASTAL
WATERWAY
SOUTHERN
Radio Tower
Grand
Caillou
Woodlawn
BAYOU
105
47
48
49
12
PROJECT LOCATION
2000' RADIUS
1000' RADIUS
SCALE IN FEET

PIT
PIT
Monitoring Well-1
B-1
Monitoring Well-2
B-2
N

T. BAKER SMITH & SON, INC.
Civil Engineers — Land Surveyors
Environmental Research
P. O. Box 2266
Houma, Louisiana 70361

MAIN OFFICE
550 SOUTH VAN
TELEPHONE (504) 868-1050
ENVIRONMENTAL RESEARCH OFFICE
401 GLYNN AVENUE
TELEPHONE (504) 868-1450
NEW ORLEANS
TELEPHONE (504) 586-8222

T. BAKER SMITH 1889 - 1962
WM. CLIFFORD SMITH, P.E., L.S.
CHARLES M. CAMP, L.S.
DON I. McCULLOUGH, P.E., L.S.
MARC J. ROGERS, P.E.
LARRY J. DUPRE, P.E.
JESSE B. NEWTON, L.S.
HORACE J. THIBODAUX, R.S.
RONNIE W. DUKE, M.S.

March 1, 1983

MAR 11 1983
HAZARDOUS MATERIALS BRANCH

Mr. Don French
U.S. EPA, Region VI
Enforcement Section (6AW-HE)
1201 Elm Street
Dallas, Texas 75270

RE: SUBSEQUENT NOTIFICATION CONCERNING POSSIBLE HAZARDOUS WASTE ACTIVITY AT DELTA SHIPYARD, INC. (LAD058475419) HOUMA, LOUISIANA

Dear Mr. French:

My client Delta Shipyards, Inc. operates a cleaning facility for vessels which are brought into their yard only for repair. This facility is located as indicated on the enclosed vicinity Map "A".

Please find enclosed the basic operational plan for the gas freeing facility. Also, please find enclosed the latest RCRA Inspection Report dated September 28, 1982 by Mr. Albert Hebert, Environmental Program Specialist of the Louisiana Department of Natural Resources-Hazardous Waste Management Division. In addition to the above documents I have completed U.S. EPA Notification of Hazardous Waste Activity Form 8700-12 (5-80).

On behalf of my client Delta Shipyard, Inc. we would like your agency and the Hazardous Waste Management Division of the State of Louisiana to consider removing the reference gas freeing facility from the treater, storer, disposer list.

Should your agency and the State of Louisiana find that my client must remain on your permitted facilities list please advise me as to the required application forms my client will need to submit to your agency and the State of Louisiana.

By copy of this letter I am also requesting the Hazardous Waste Management Division of the State of Louisiana to give strong consideration to my client's request.

Your favorable consideration to our request would be greatly appreciated.

When communicating with my client please direct all correspondence to my attention or forward me a copy of said correspondence you may direct to my client.

Should you have any questions concerning our request please feel free to contact me.

Very truly yours,

T. BAKER SMITH & SON, INC.

Horace J. Thibodaux

HORACE J. THIBODAUX, R.S.
Director of Environmental Research

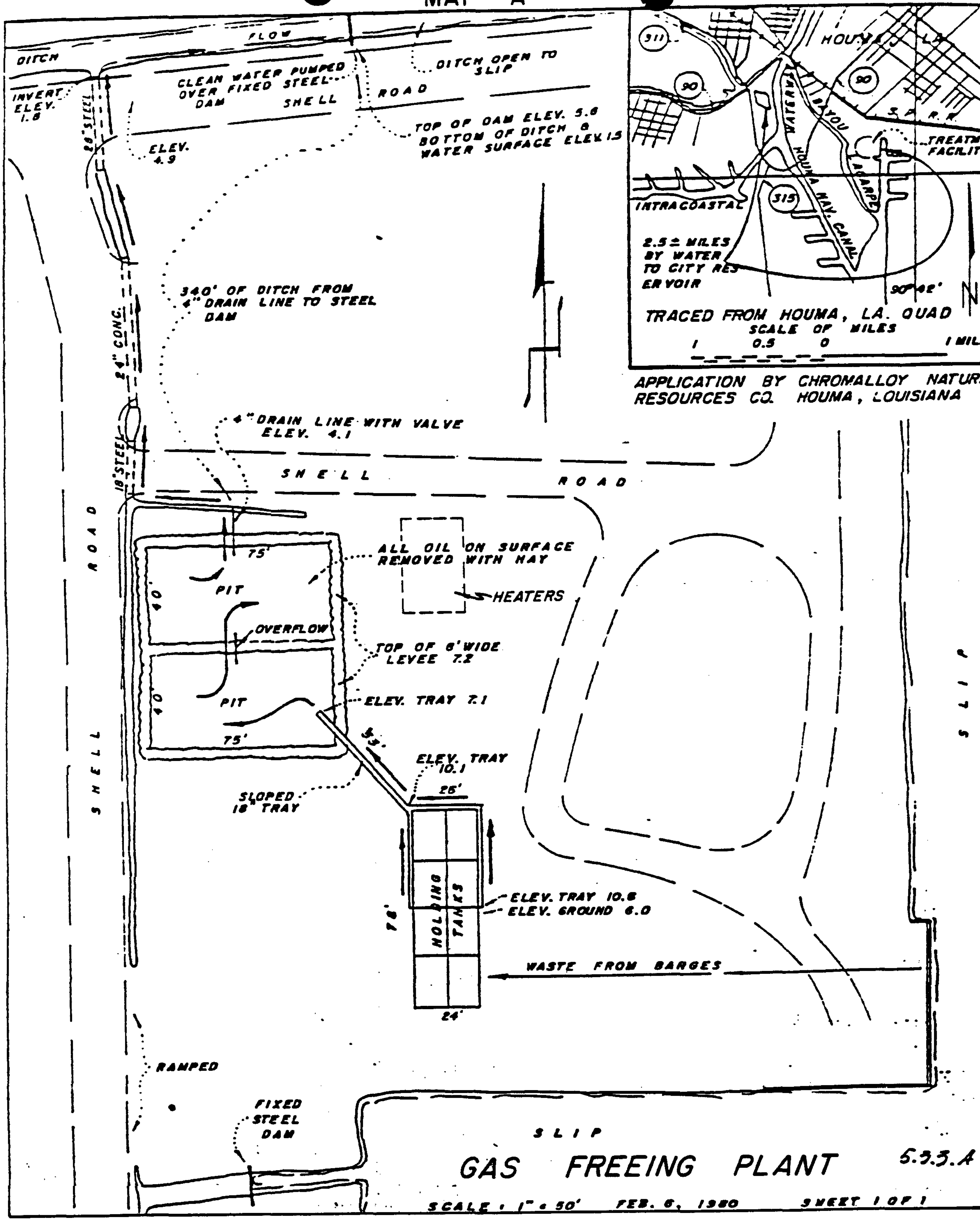
HJT:dtt
Enclosure:
1) Operation Plan
2) RCRA Inspection-9/28/82
3) EPA Form 8700-12

cc: Mr. Gerald D. Healy, Jr., P.E., MPH, Admin.
Hazardous Waste Management Division

CERTIFIED MAIL RETURN RECEIPT REQUESTED
NO. 6230323 (EPA)

CERTIFIED MAIL RETURN RECEIPT REQUESTED
NO. 6230327 (Hazardous Waste Mgmt. Division)

MAP "A"



GAS FREEING PLANT

5.3.3.A

SCALE: 1" = 50' FEB. 6, 1980 SHEET 1 OF 1

Delta Shipyard Vessel Cleaning Operational Plan

Proposed waste to be handled at the Delta Shipyard Vessel Cleaning Plant are crude residuals such as diesel, crude oil, lube oil, #6 oil, Bunker "C" and fish oils. The estimated quantity of reclaimable material to be generated is $\pm$16 tons per month average with an estimated maximum during peak years of $\pm$1000 tons per year.

It is Delta Shipyard's intent to operate, control the equipment and conduct the operations of its vessel cleaning plant as necessary to be in compliance with all applicable Federal, State and local regulations relative to pollution prevention, safety and profitable operations.

Description of Process:

Only residual oil and fuels are handled at the vessel cleaning facility.

Products <u>not</u> to be cleaned at the vessel cleaning plant are as follows:

Styrene

Coke

Asphalt

Butane

Chemicals

Vegetable Oil

Benzene

Soy Beans

Slop Barges

Animal Fats

Cleaning Process

A vessel is first brought to the mooring areas as shown in Figure 56. If a fuel is in a vessel it is removed into storage (Figure 57) through the conventional suction system as shown in Figure 58. If after checking with the customer the fuel is not desired it is pumped into storage at the storage location shown in Figures 59 and 57. Wash water (recycled out of pit) is then pumped into the vessel as shown in Figure 60 . Wash water is then removed as shown in Figure 61 and sent to the separating vessel then to the waste pit and the heating tank as shown in Figure 61.

When a vessel is received with No. 6 oil or Buncker "C" oil a hot water wash is used. Hot water is injected into the vessel as shown in Figure 62. The hot water is then separation by suction hose to the tower and Pump P, then to the treating vessel, then to the pit as shown in Figure 63.

When an oily waste from a vessel is received oil and water are separated as shown in Figure 65. Hot water or steam may be sent to heating coils as shown in Figure 64.

Oil cargo barges 120 ft. to 300 ft. long, self propelled vessels 40 ft. to 200 ft. long with drafts not to exceed 8 ft. are the only types of vessels handled.

Monitoring Procedures:

A ledger of all activities at the vessel cleaning plant are kept by the gas freeing plant foreman. These records show all vessels cleaned, types of cargo, plant shut down and emergencies.

The vessel cleaning facility has a drip and discharge collection system as shown in Figure 65. The entire gas freeing plant with the exception of pump P_5 can be shut down by pulling the master switch inside the control room. Pump P_5 is the yard air system and can be shut down by closing the valve supplying air.

Each pump has it's own disconnect switch in the control room. (Note: the transfer pumps P_7 and P_8 are centrifugal type and no pressure relief valves are required.

The boilers, normally used to heat water, have fail-safe pilot controls, fuel control and high pressure cut-out. A master gas valve 4" is located at the yard meter, at the intersection of Zerangue and Industrial Boulevards.

Delta Shipyard, Inc. has a contingency plan and containment equipment available should a spill occur.

All waste oil is sold to an oil reclaimer.

NOTE: No point source discharge exist from the waste water pit on site.

5.3.4.A.1

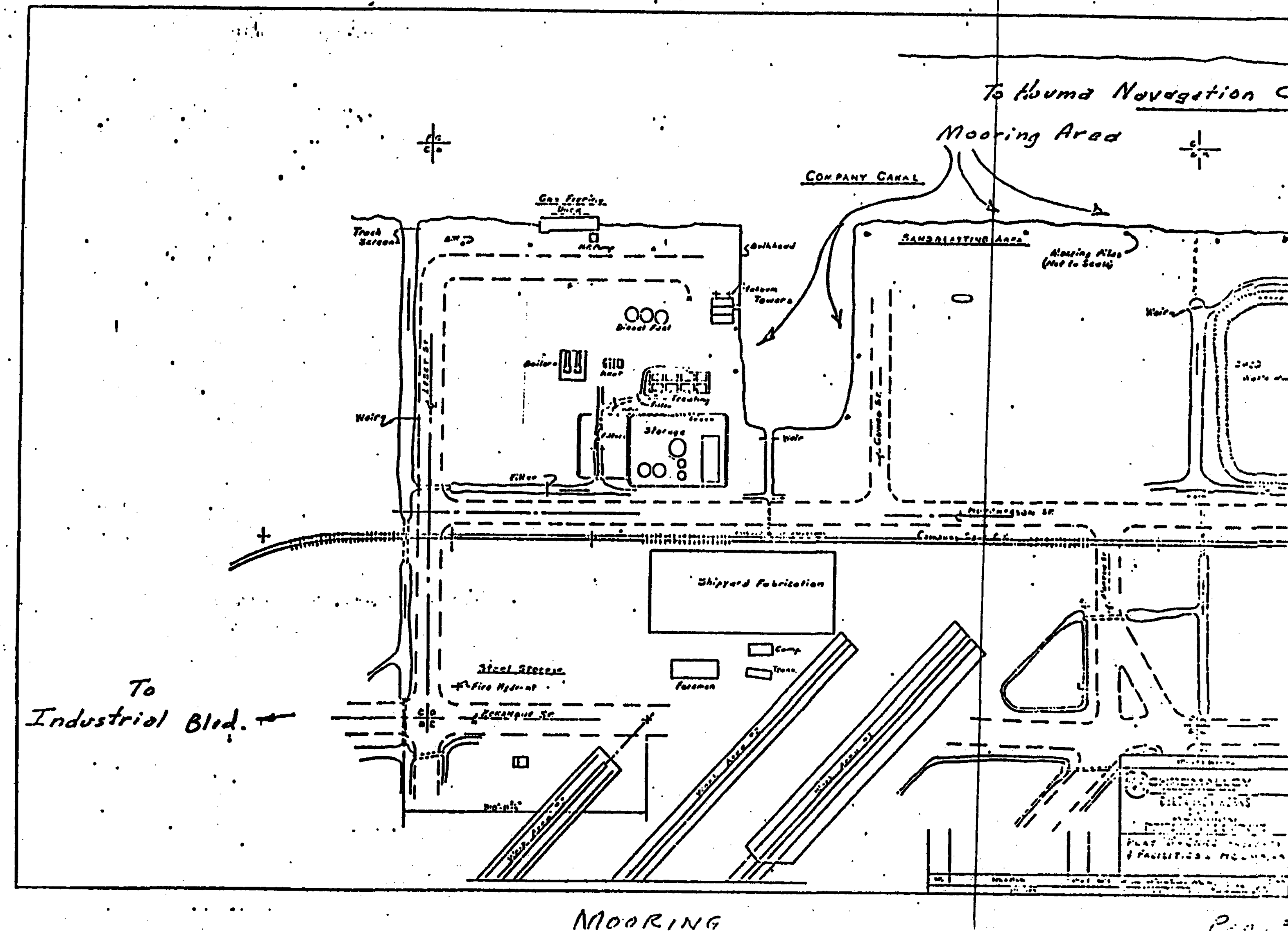
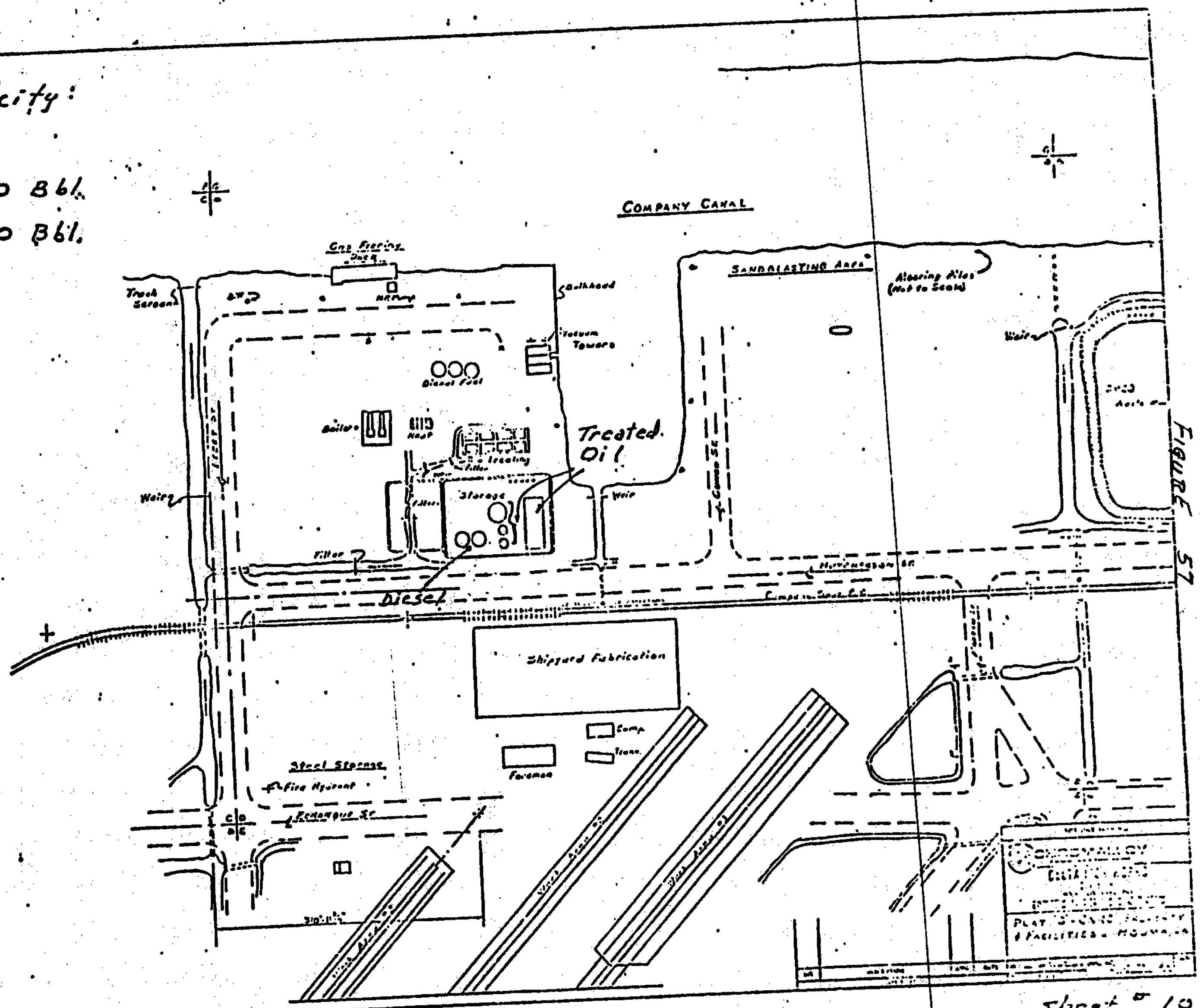


FIGURE 56

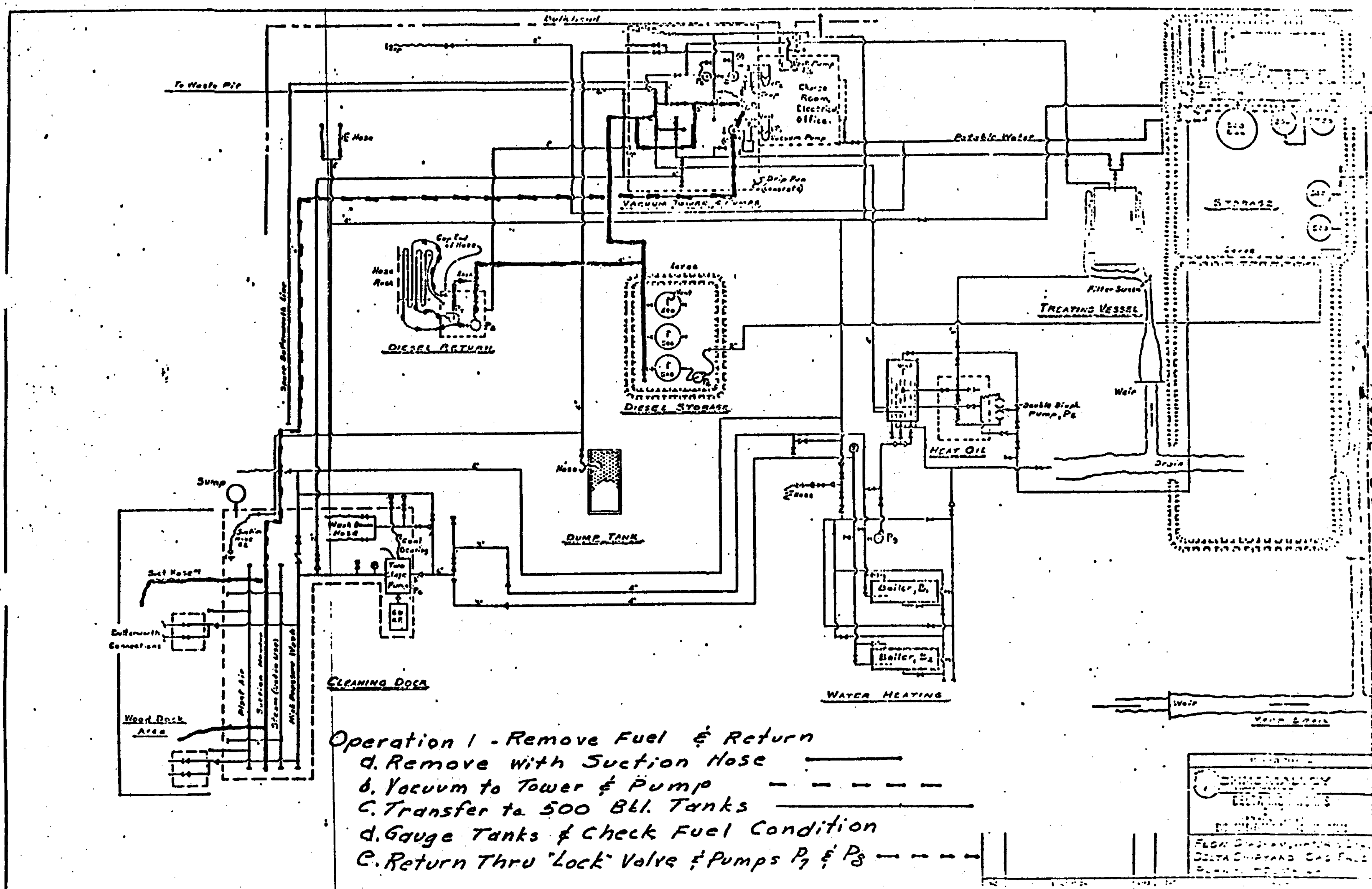
Storage Capacity:

Diesel - 2500 Bbl.
Oil - 3550 Bbl.

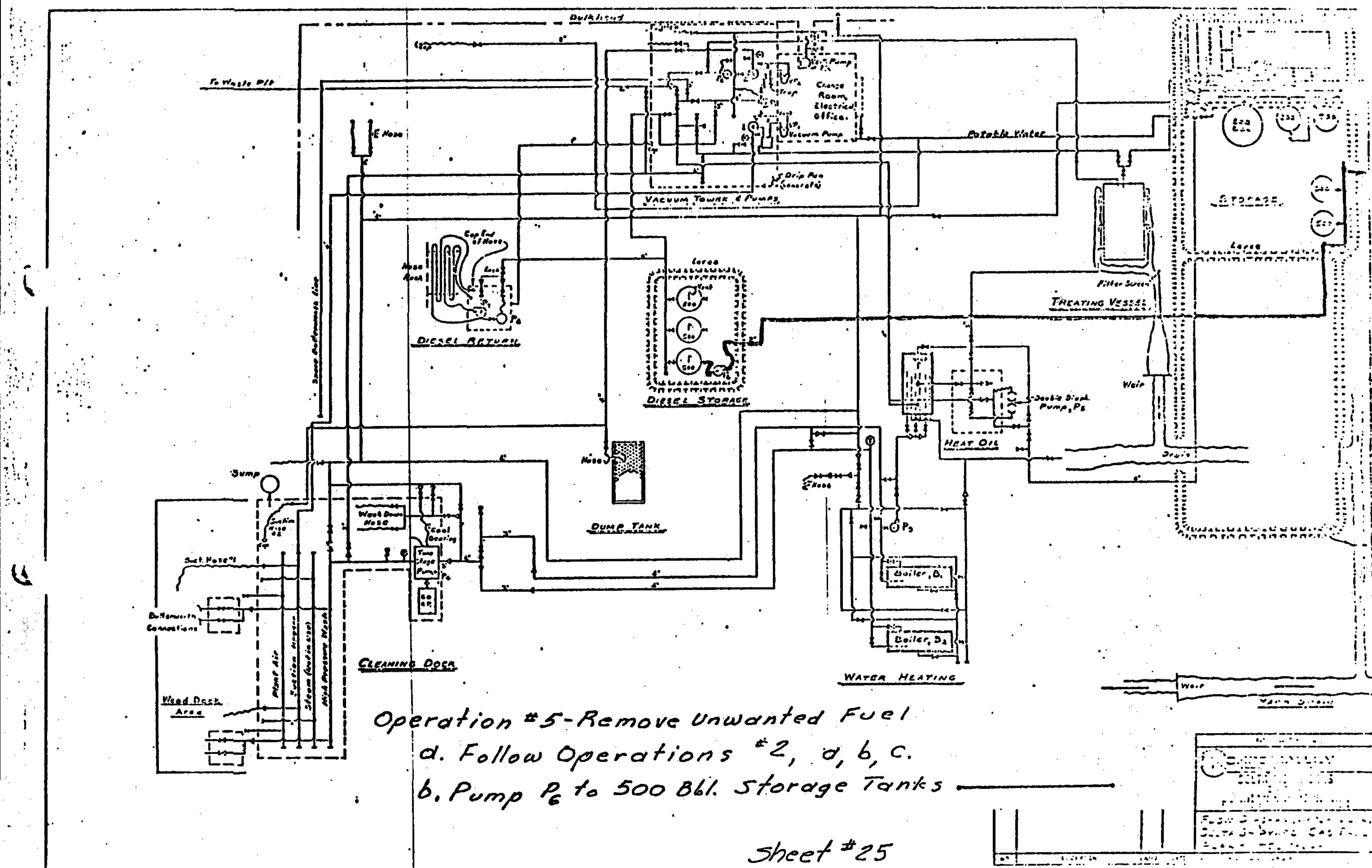


Storage Systems, Oil & Fuel

Sheet # 10



Bulkhead
To Waste Pit
Hose
Charge Room, Electrical Office
Potable Water
Drip Pan
Vacuum Tower & Pumps
Storage
Levee
Hose Rack
DIESEL RETURN
DIESEL STORAGE
Filter Screen
TREATING VESSEL
Weir
Double Diaph. Pump, P8
HEAT OIL
Drain
Sump
Wash Down Hose
Coal Bearing
DUMP TANK
Suction Hose
Butterworth Connections
Wood Dock Area
Plant Air
Suction
Steam
High Pressure Wash
Spare Butterworth Line
CLEANING DOCK
Boiler, B1
Boiler, B2
WATER HEATING
Yard Drain
FIGURE 58
Operation 1 - Remove Fuel & Return
a. Remove with Suction Hose
b. Vacuum to Tower & Pump
c. Transfer to 500 Bbl. Tanks
d. Gauge Tanks & Check Fuel Condition
e. Return Thru "Lock" Valve & Pumps P7 & P8



Operation #5 - Remove Unwanted Fuel

a. Follow Operations #2, a, b, c.

b. Pump P_6 to 500 Bbl. Storage Tanks

Sheet #25

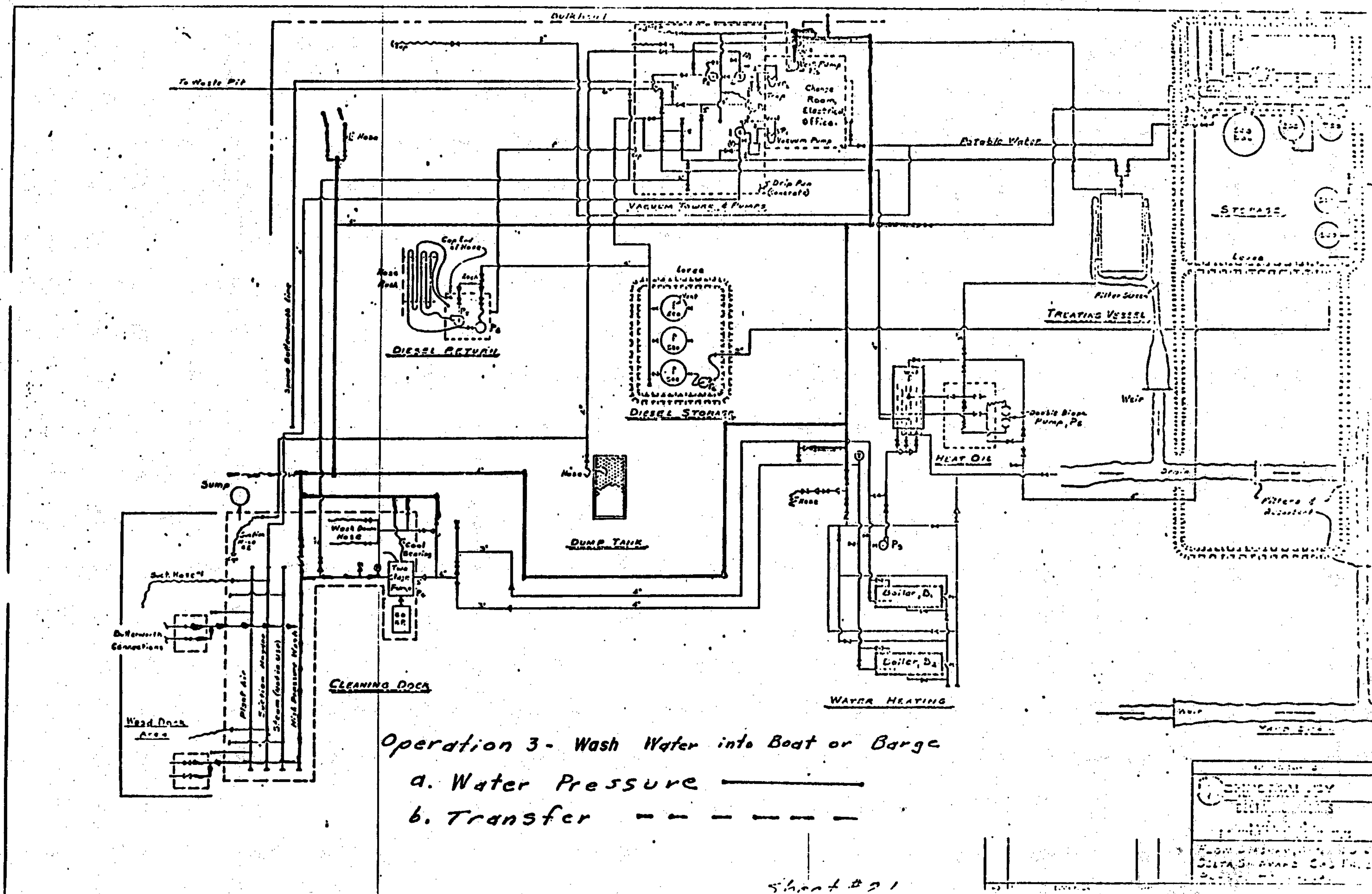


FIGURE 60

Operation 3 - Wash Water into Boat or Barge

a. Water Pressure ————

b. Transfer — — — — —

Sheet #21

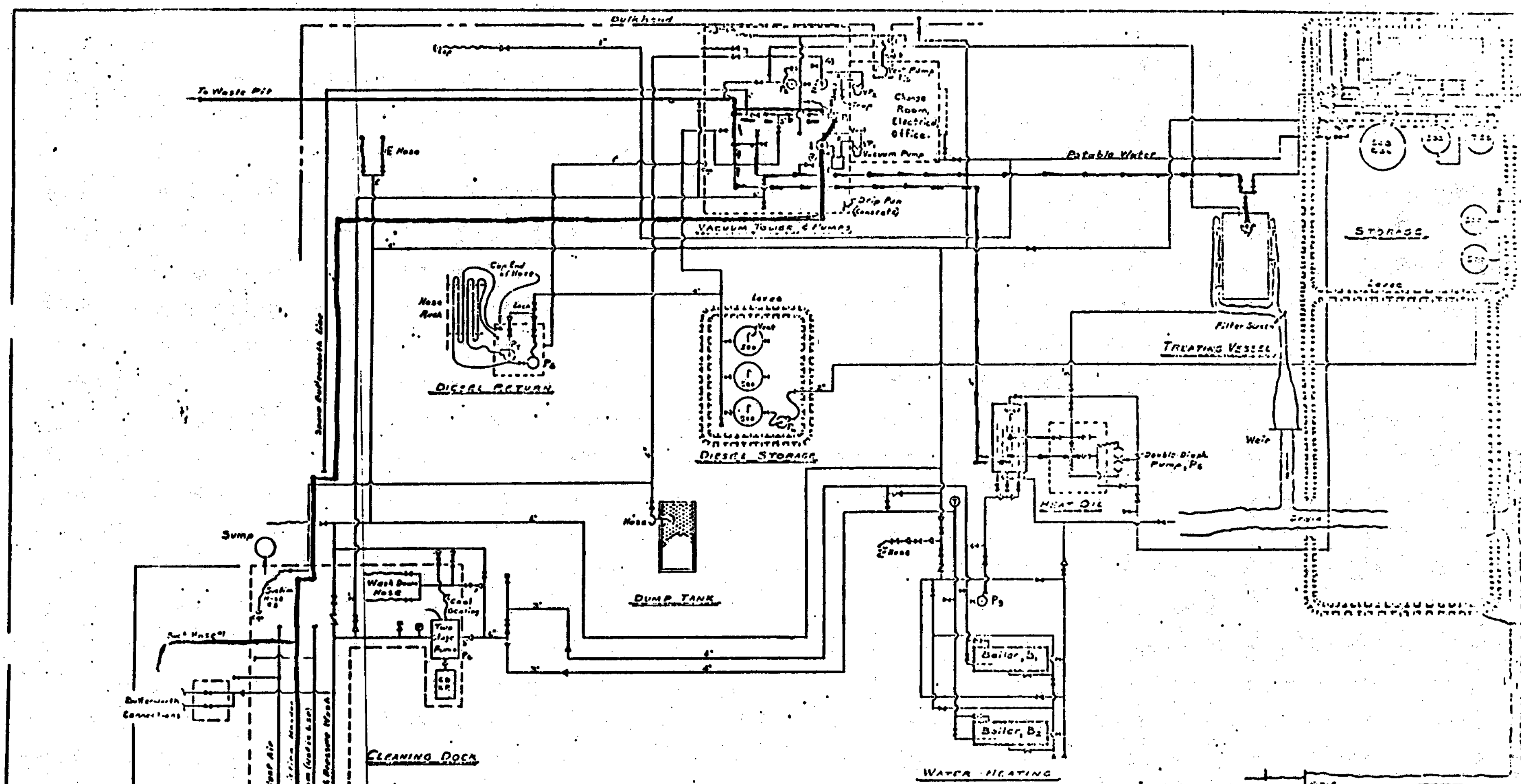


FIGURE 61

Operation #4 - Remove Wash Water

a. Suction Hose to Tower & Pump P_1

b. P_1 to Separating Vessel

c. P_1 to Waste Pit

d. P_1 to Heating Tank

Sheet #24

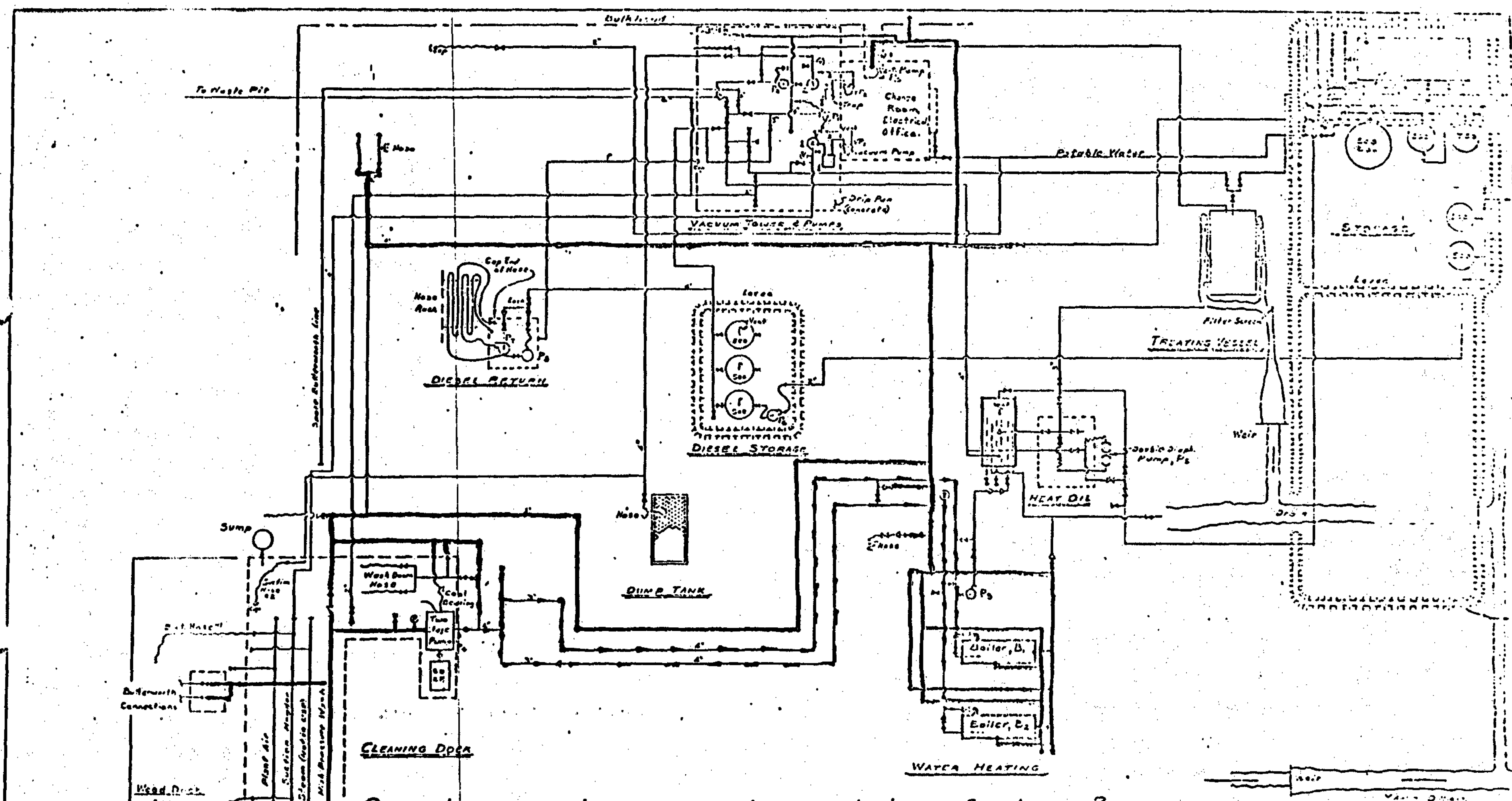


FIGURE 6.2

Operation - Heat Water & Inject into Boat or Barge

a. Water to Boilers from Pump P_3 & Header

b. Heated Water to 2-Stage Pump P_4

c. P_4 to Header & Butterworth Connections

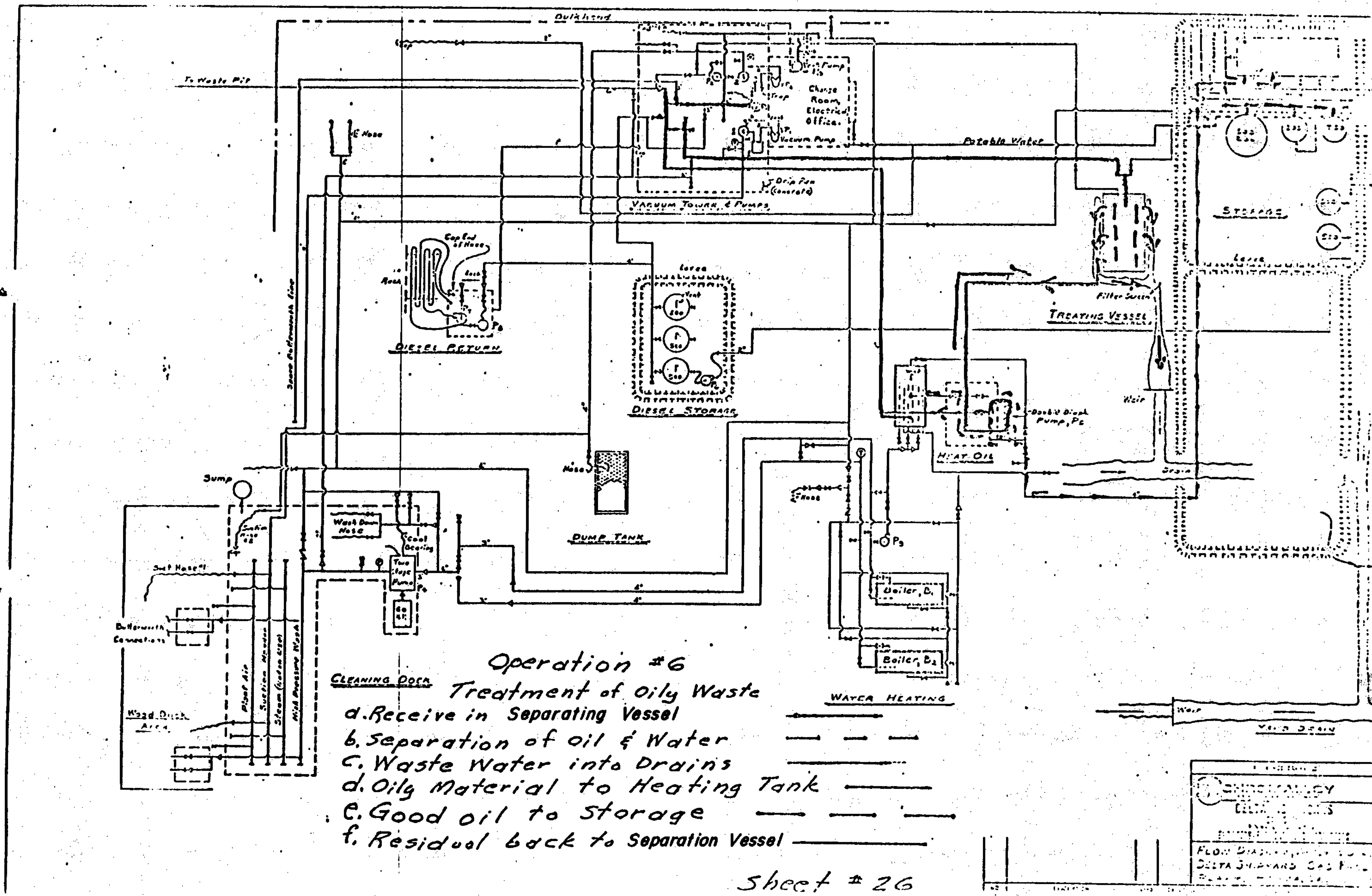
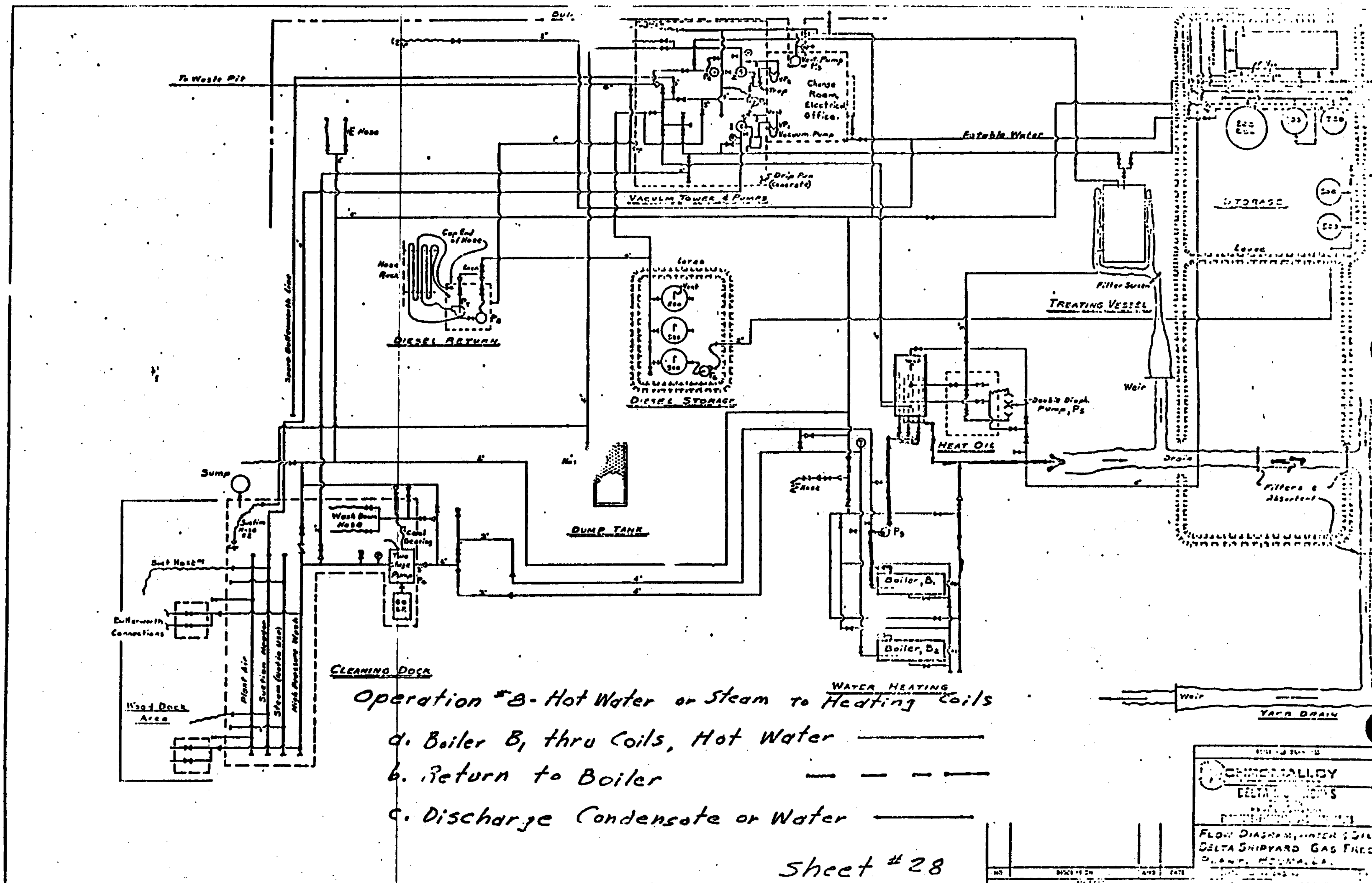


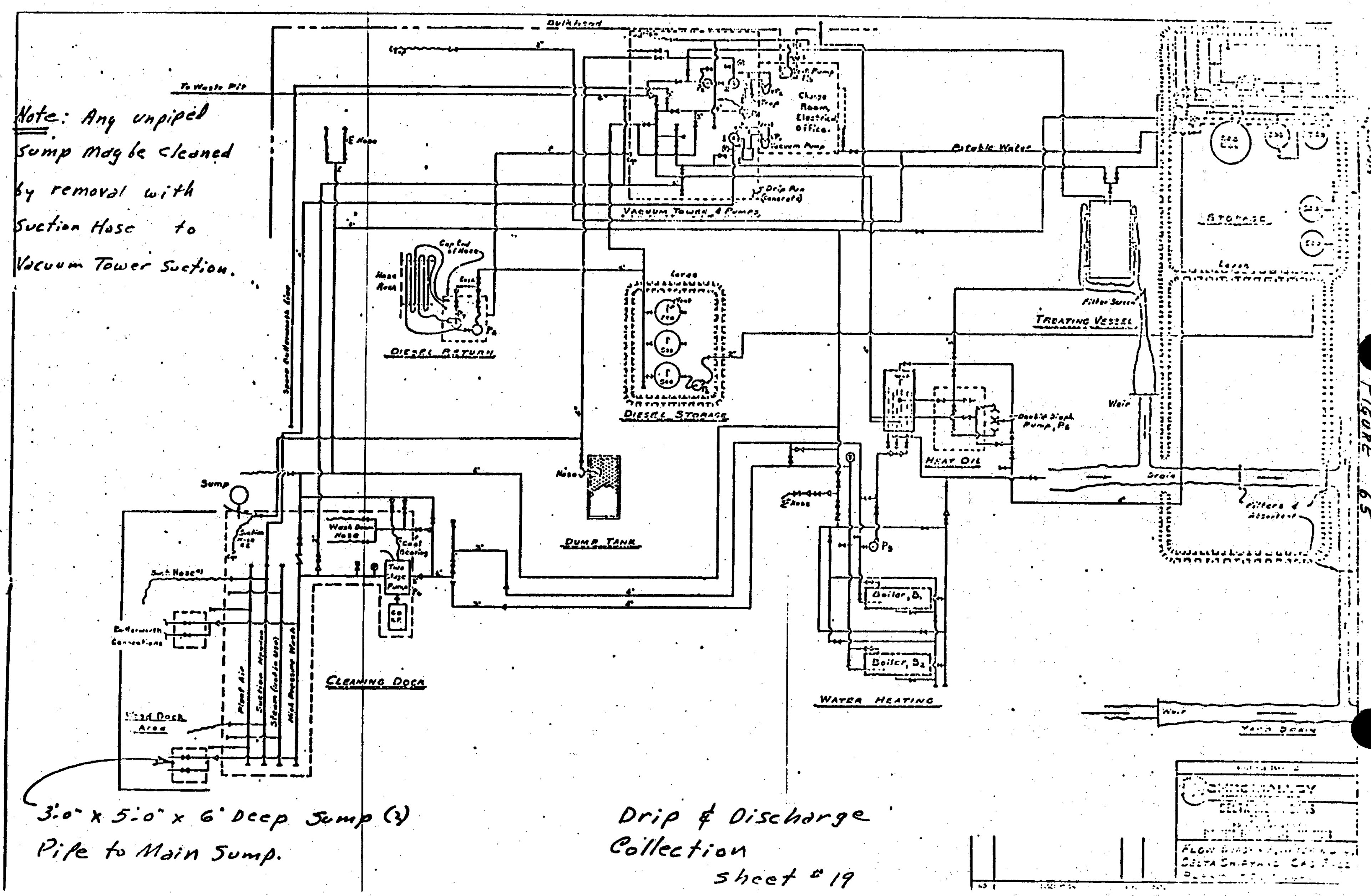
FIGURE 63

Sheet #26



To Waste Pit
E Hose
Vacuum Tower & Pumps
Drip Pan (Concrete)
Charge Room, Electrical Office.
Vacuum Pump
Vent Pump
Potable Water
Storage
Levee
Filter Screen
Treating Vessel
Weir
Drain
Filters & Absorbent
Yard Drain
Hose Rack
Cap End of Hose
Diesel Return
Diesel Storage
Double Diaph. Pump, P_5
Heat Oil
Boiler, B_1
Boiler, B_2
Dump Tank
Sump
Wash Down Hose
Trans. Pump
Butterworth Connections
Wood Dock Area
Pilot Air
Suction Header
Steam (and/or use)
High Pressure Wash
Cleaning Dock
Operation #8 - Hot Water or Steam to Water Heating Coils
a. Boiler B_1 thru Coils, Hot Water
b. Return to Boiler
c. Discharge Condensate or Water
Sheet #28
Chem-Malloy
Flow Diagram, Water Coil, Delta Shipyard Gas Free Plant, Houma, La.

FIGURE 64



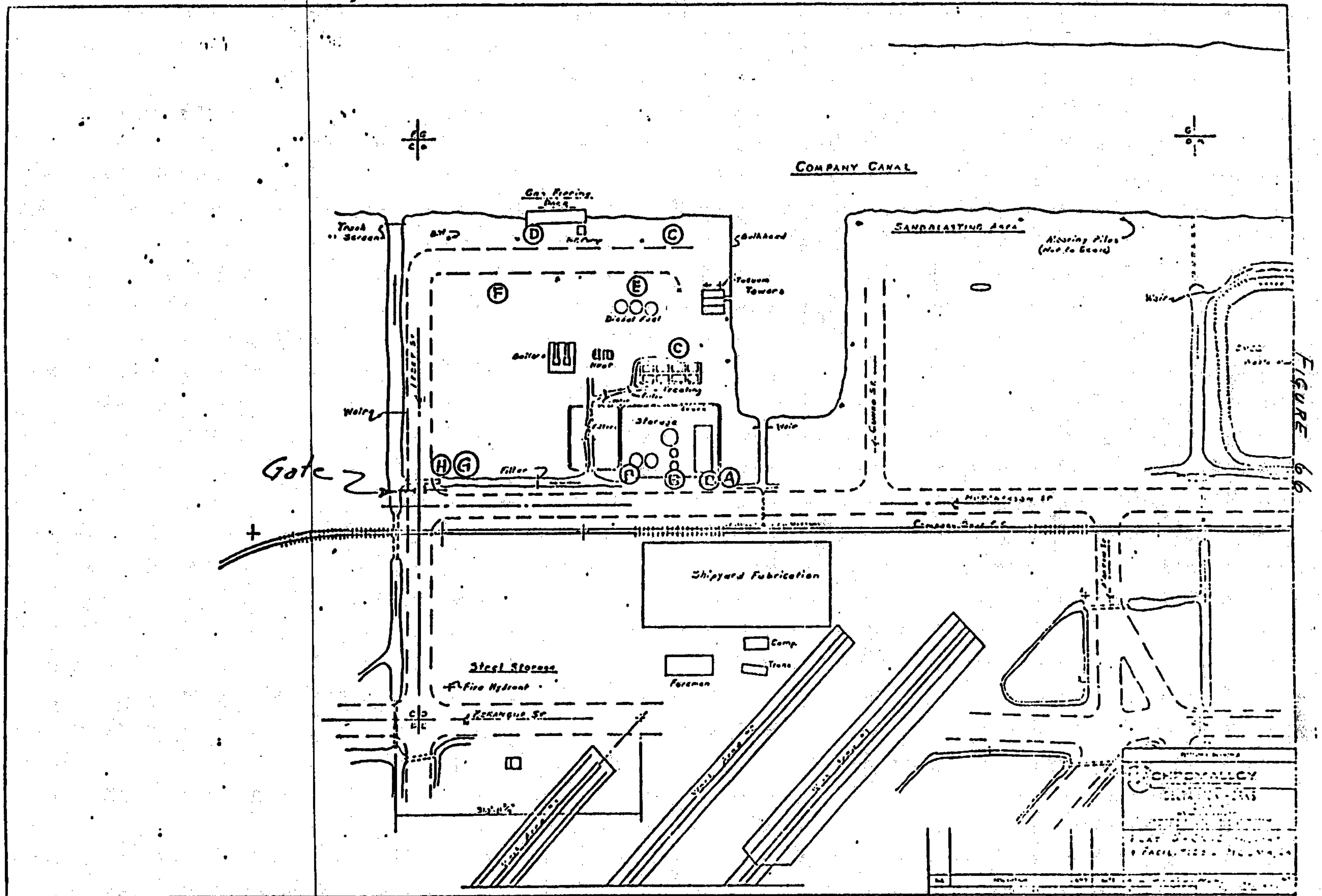
Note: Any unpiped sump may be cleaned by removal with Suction Hose to Vacuum Tower Suction.

3'0" x 5'0" x 6" Deep Sump (3) Pipe to Main Sump.

Drip & Discharge Collection

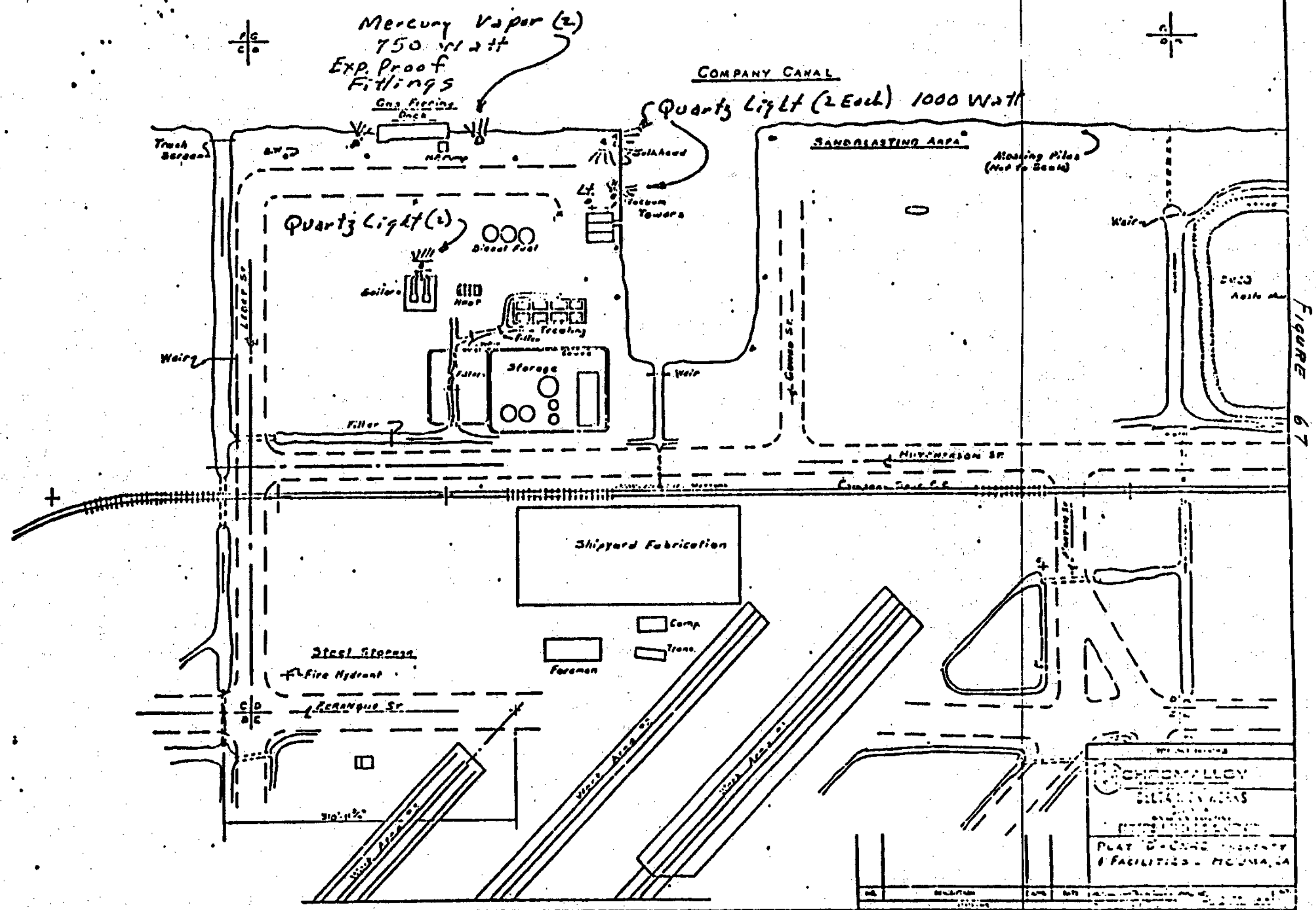
sheet # 19

FIGURE 65

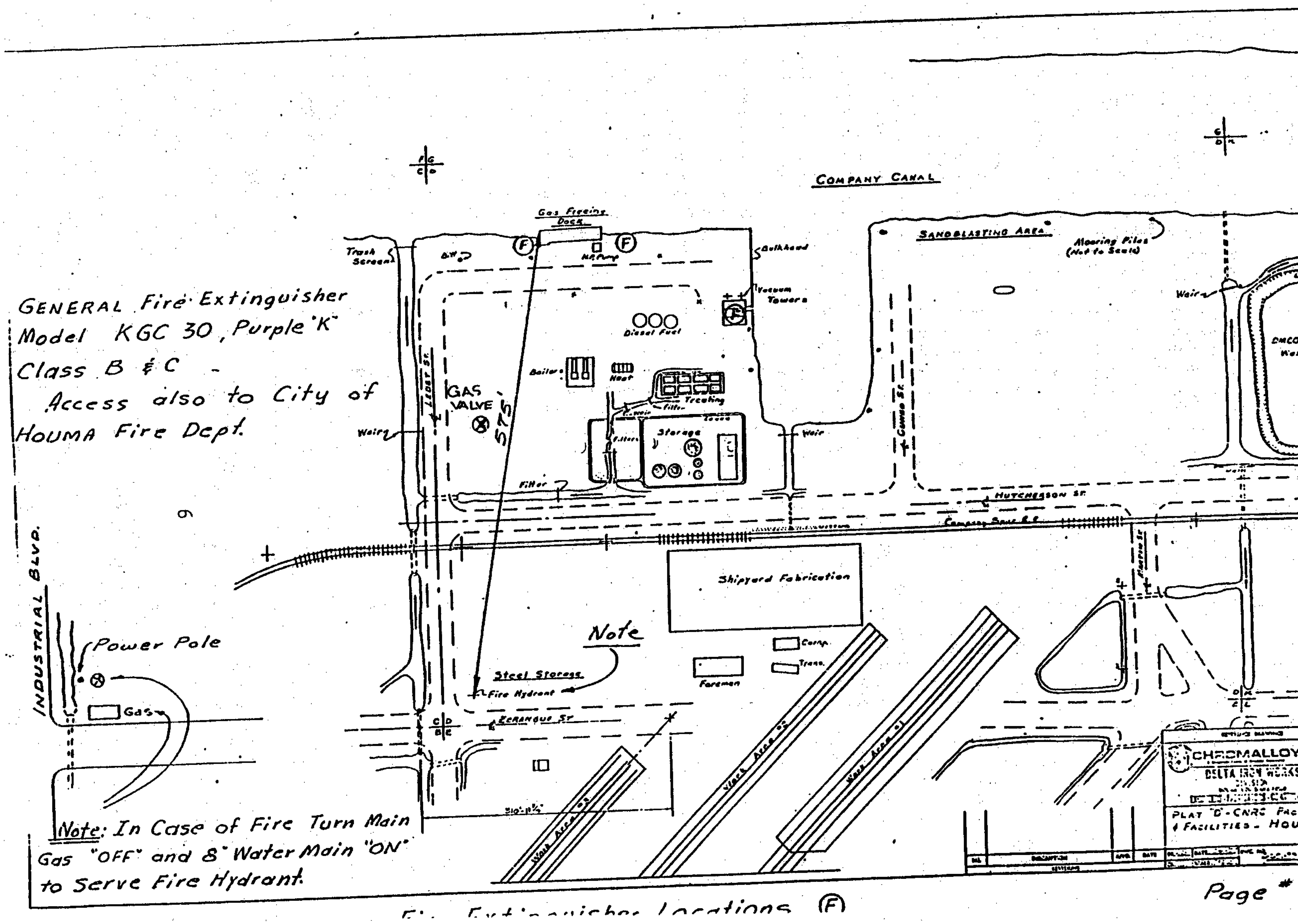


Locations of Signs (see Sheet #14 for Code)

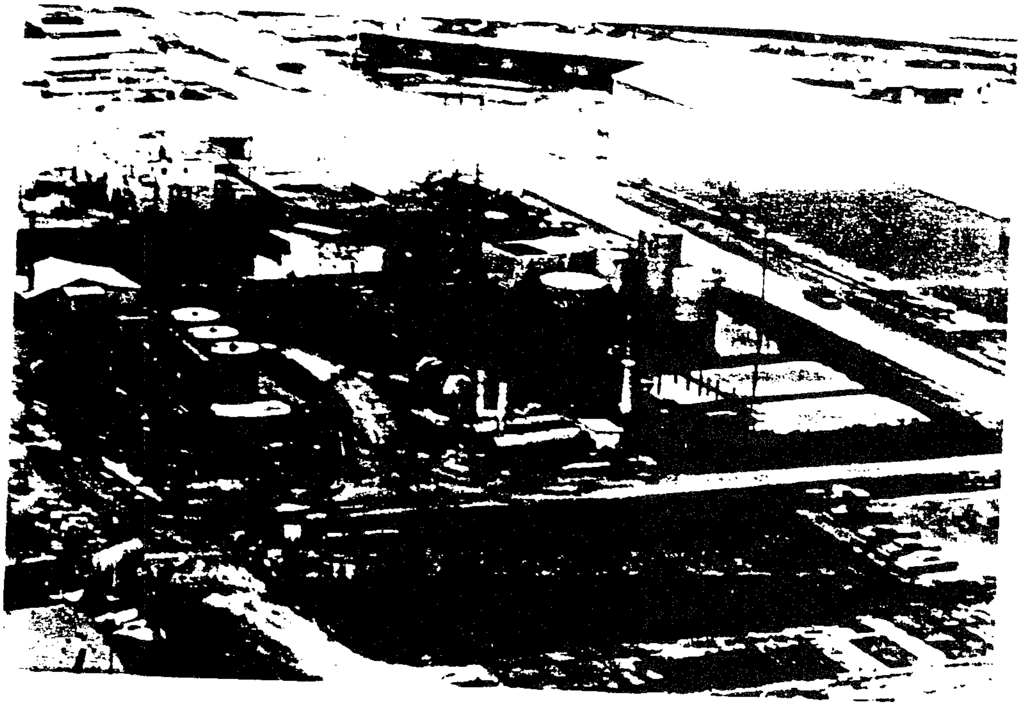
Note: Work is normally conducted during daylight hours.

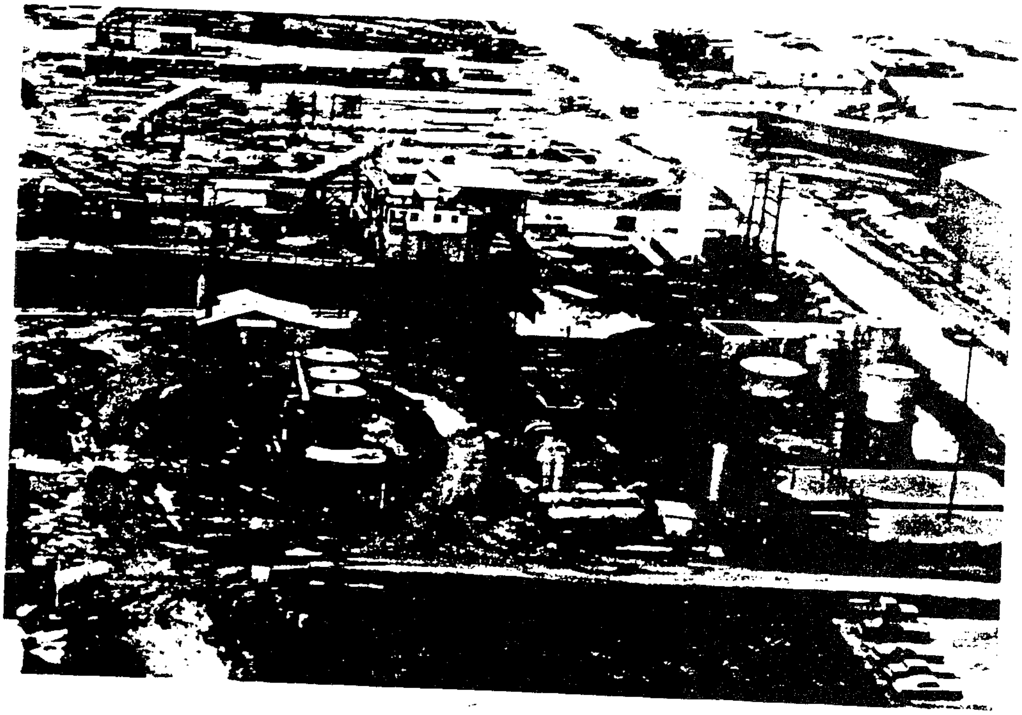


sheet # 9



GENERAL Fire Extinguisher
Model KGC 30, Purple "K"
Class B & C -
Access also to City of
Houma Fire Dept.
COMPANY CANAL
Gas Freeing Dock
Trash Screen
Bulkhead
Vacuum Towers
SANDBLASTING AREA
Mooring Piles (Not to Scale)
Weir
Diesel Fuel
Boilers
Heat
Treating
Filter
Storage
GAS VALVE
575'
Ledet St.
Cunnio St.
Hutchesson St.
Company Spur R.R.
Shipyard Fabrication
Note
Steel Storage
Fire Hydrant
Foremen
Comp.
Trans.
INDUSTRIAL BLVD.
Power Pole
Gas
Ecrangue St
Wet Area
Weir Area
CHROMALLOY
DELTA IRON WORKS
PLAT "D" - CNRC Facs
& FACILITIES - HOU
Note: In Case of Fire Turn Main
Gas "OFF" and 8" Water Main "ON"
to Serve Fire Hydrant.
Page #





RECEIVED OCT 11 1981

State of Louisiana

FRANK P. SIMONEAUX
SECRETARY
B. JIM PORTER
ASSISTANT SECRETARY

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF ENVIRONMENTAL AFFAIRS

HAZARDOUS WASTE MANAGEMENT DIVISION

GERALD D. HEALY, JR.
ADMINISTRATOR

October 7, 1982

Mr. Horace J. Thibodaux
T. Baker Smith & Son, Incorporated
Post Office Box 2266
Houma, Louisiana 70361

Dear Mr. Thibodaux:

As per your request of September 29, 1982, please find enclosed a copy of the RCRA inspection of September 28, 1982.

If we can be of further assistance, please do not hesitate to contact this office.

Sincerely yours,

Frank L. Dautriel

FRANK L. DAUTRIEL
Enforcement Program Manager

FLD:tlb

Enclosure

STATE ID.# GD-343

RCRA INSPECTION

DATE: 9/2-/-

I. SITE IDENTIFICATION

A. Site Name: DELTA SHIPYARD

B. Street (or other identifier): INDUSTRIAL BLVD.

C. City: HOUMA

D. State: LA.

E. Zip Code: 70361

F. County N.: TERREBONNE

G. Site Operator Information

1. Name: RALPH ARCENEAUX

2. Telephone Number: (504) 868-7450

3. Street: P.O. BOX 101

4. City: HOUMA

5. State: LA.

6. Zip Code: 70361

H. Site Description

GAS FREE/TANK CLEANING FOR SHIPYARD

I. Latitude (deg.-min.-sec.) 29° 34' 02" N   Longitude (deg.-min.-sec.) 90° 42'

J. Type of Ownership

__1. Federal __2. State __3. County __4. Municipal X 5. Private

K. X 1. Generator __2. Transporter __3. Treatment __4. Storage X 5. Disposa

INSPECTION INFORMATION

A. Principal Inspector Information

1. Name: ALBERT HEBERT

2. Title: ENVIRONMENTAL PROGRAM SPEC

3. Organization: LA D.N.R.

4. Telephone No. (area code & No.): (504) 342-1227

B. Inspection Participants

CHRIS OLIVIER   VICE PRESIDENT OPERATIONS MANAGER

EHM - EAC 7

NARRATIVE SHEET

[illegible] MANIFEST USED TO SHIP WASTE OIL TO THE OIL RECLAIMER. MR CLIVIER STATED THAT THIS WAS MOSTLY FOR THEIR BENEFIT SO THE COULD KEEP TRACK OF THE WASTE.

TANKS: THREE TANKS ARE USED TO STORE DIESEL FUEL OF BOATS BEING REPAIRED

FOUR TANKS USED FOR RESALVAGED OIL.

ALL TANKS ARE DIKED, PAINTED AND VERY NEAT IN APPEARANCE.

[illegible]RFACE IMPOUNDMENT: IMPOUNDMENTS USED TO SKIM OIL AND ALSO AS A HOLDING POND FOR THE RECYCLE WATER USED IN BARGE CLEANING.

THIS COMPANY HAS A VERY GOOD HOUSEKEEPI[illegible] POLICY.

THIS INSPECTOR HAS RECOMMENDED TO THE COMPANY THAT THEY FILL OUT THE PROPER FORMS TO BE DELETED FROM THE RCRA LISTING AS THEY DO NOT PRODUCE HAZARDOU[illegible] WASTE.

RCRA COMPLIANCE I[illegible] EC[illegible] ON REPORT
GENERATORS [illegible]HECKLIST

Note: On multiple part questions, circle those not in compliance.

Section A - EPA Identification No.

1. Does Generator have EPA I.D. No.? (262.12 - EPA I.D. No.) [illegible]

   a. If yes, EPA I.D. No. L A D 0 5 8 0 7 5 4 7 9

Section B - Hazardous Waste Determination

1. Does generator generate hazardous waste(s) listed in Subpart D (261.30 - 261.33 - List of Hazardous Waste)?

   a. If yes, list wastes and quantities on attachment (Include EPA Hazardous Waste No.) (Provide waste name and description.)

2. Does generator generate solid waste(s) that exhibit hazardous characteristics? (corrosovity, ignitability, reactivity, EP toxicity) (261.20 - 261.24 - Characteristics of Hazardous waste

   a. If yes, list wastes and quantities on attachment. (Includ Hazardous Waste No.) (Provide waste name and description)

   b. Does generator determine characteristics by testing or by applying knowledge of processes? N.A.

      1. If determined by testing, did generator use test methods in Part 261, Subpart C (or Equivalent)? N[illegible]

      2. If equivalent test methods used, attach copy of equivalent methods used.

3. Are there any other solid wastes deemed non-hazardous gererated by generators? i.e.(process waste streams, collected matter from air pollution control equipment, water treatment sludge, etc.)

   a. If yes, did generator determine non-hazardous characteristi by testing or knowledge of process?

      1. If determined by testing, did generator use test methods in Part 261, Subpart C (or Equivalent)? A[illegible]

      2. If equivalent test methods used, attach copy of equivalent methods used.

   b. List wastes and quantities deemed non-hazardous or processe from which non-hazardous wastes were produced. (Use narrati explanations sheet.)

Section [hole punch] Manifest

1. Does generator ship hazardous waste off-site? (Subpart B - The Manifest)
   ____ Yes

   a. If no, do not fill out Section C and D.

   b. If yes, identify primary off-site facility(s). Use narrative explanations sheet.)

2. Has generator shipped hazardous waste off-site since November 19, 1980?
   ____ Yes

3. Is generator exempted from regulation because of:

   Small quantity generator (261.5 - Special requirements)

   OR
   N.A. Yes

   Produces non-hazardous waste at this time (261.4 - Exclusions)
   N.A. Yes

4. If not exempted does generator use manifest? (262.20 - General requirements)
   X Yes (SEE NA SHEE

   a. If yes, does manifest include the following information (262.21 - Required information) (Break up items or circle ones not on manifest)

      1. Manifest Document No. X Yes _

      2. Generators Name, Mailing Address, Tele. No. X Yes _

      3. Generator EPA I.D. No. ____ Yes _

      4. Transporter(s) Name and EPA I.D. No. (NO E.P.A. #) X Yes _

      5. a. Facility Name, Address and EPA I.D. No. (NO E.P.A. I.D.#) X Yes _
         b. Alternate Facility Name, Address and EPA I.D. No. ____ Yes _
         c. Instructions to return to generator if undeliverable? MATERIAL HAULED BY OIL RECLAIMER ____ Yes _

      6. DOT description of the waste X Yes _

      7. a. Quantity (weight or volume) X Yes _
         b. Containers (type and number) X Yes _

      8. Emergency Information (optional) (special handling instructions, Phone No.) N.A. Yes _

9. Is the following c[illegible]ification on each manifest form?

   This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.

5. Does generator retain copies of manifests? (262.40 - Recordkeeping) (Check completed manifests at random. Indicate how many manifests were inspected, how many violations were noted and the type of violation.)

   If yes, complete a through e. If questions contain more th[illegible] item, circle those not in compliance.

   a. (1) Did generator sign and date all manifests inspected?
      (2) Who signed for generator? Name D. CHAISSON

   b. (1) Did generator obtain handwritten signature and date of acceptance from initial transporter?
      (2) Who signed and dated for transporter? Name R. RA[illegible]

   c. Does generator retain one copy of manifest signed by generator and transporter?

   d. Do returned copies of manifest include facility owner/operator signature and date of acceptance?

   e. If copy of manifest from facility was not returned with[illegible] 45 days, did generator file an exception report? (262.42 - Exception reporting) HAS NOT BEEN NECESS[illegible]
      7 DAYS

      (1) If yes, did it contain the following information?

         Legible copy of manifest
         AND
         Cover letter explaining generators efforts to locate waste.

   f. Does (will) generator retain copies for 3 years?

Section D - Pre-Transport Requirements

1. Does generator package waste? ____ Ye

   If no, skip the rest of Section D.
   If yes, complete the following questions.

2. Does generator package waste in accordance with 49 CFR 173 178, and 179? (DOT requirements) (262.30 - Packaging) ____ Yes

3. Inspect containers to be shipped.
   a. Are containers to be shipped leaking or corroding or bulging? ____ Yes
   b. Use narrative explanations sheet to describe containers and condition. ____ Yes
   c. Is there evidence of heat generation from incompatible wastes in the containers? ____ Yes

4. Does the generator use DOT labeling requirements in accordance with 49 CFR 172? (262.31 - Labeling) ____ Yes

5. Does the generator mark each package in accordance with 49 CFR 172? (262.32 - Marking) ____ Yes

6. Is each container of 110 gallons or less marked with the following label? (262.32 - Marking) ____ Yes

   Label saying: HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

   Generator's Name and Address ______________________

   ____

   Manifest Document Number ______________________

7. If there are any vehicles present on site loading or unloading haz waste, inspect for presence of placards. Note this instance on na explanation sheet.

8. Accumulation Time (262.34 - Accumulation Time)
   a. Is facility a permitted storage facility? ____ Yes

   If yes, skip to question #9.
   If no, answer rest of question #8.

   b. Are containers used to store waste? ____ Yes

      (1) If yes, visually inspect containers.
      Is the beginning date of accumulation time clearly indicated? ____ Yes v

c. (1) Does generator inspect containers for leakage or corrosion? (265.174 - Inspections) ____

(2) If yes, with what frequency? ____

d. (1) Does generator handle ignitable or reactive waste? ____ Y

(2) If yes, does generator locate containers holding ignitable or reactive waste at least 15 meters (50 feet) inside facility's property line? (265.176 - Special Requirements for Ignitable or Reactive Wastes) ____ Ye

NOTE: If tanks used, fill out checklist for tanks. — SEE NAR SHEET

NOTE: If generator accumulates waste on-site for less than 90 days checklist for Facilities, Part 265 - Subparts C and D (Sectio C of Facilities Checklist) and Section A, Question #7 (Personn Training).

9. Describe storage area. Use photos and narrative explanation shee

Section E - Recordkeeping and Records

1. Is generator keeping the following reports? (262.40 - Recordkeeping) (Note: The following must be kept for a minimum of three (3) years.)
   a. Manifests and signed copies from designated facilities? X Yes ___
   b. Annual reports (Not applicable until March 1982) X Yes ___
   c. Exception Reports N.A. Yes ___
   d. Test results where applicable. N.A. Yes ___
2. Where are records kept (at facility or elsewhere)? FACILITY
3. Who is in charge of keeping the records? Name C. CULVER Titl

Section F - Special Condition

1. Has generator received from or transported to a foreign source any hazardous waste? (262.50 - International Shipments) N.
   a. If yes, has he filed a notice with the Regional Administrator? ____ Yes ____
   b. Is this waste manifested and signed by Foreign consignee? ____ Yes /
   c. If generator transported wastes out of the country has he received confirmation of delivered shipment? ____ Yes N/

RCRA COMPLIANCE INSPECTION REPORT
TSD FACILITIES CHECKLIST

Section A - General Facility Standards

1. Does facility have EPA Identification No.? (265.11 - Identification Number) ✓ Yes ___ N
   A. If yes, EPA I.D. No. LAD058075479
      If no, explain ___
2. Has facility received hazardous waste from a foreign source? (265.12 - Required notices) ___ Yes X N
   A. If yes, has he filed a notice with the Reg. Admin. ___ Yes ___ N

Waste Analysis

3. Does the facility have a written waste analysis plan? (265.13 - General Waste Analysis) ___ Yes ___ No
   A. If yes, is a copy maintained at the facility? ___ Yes ___ No
   B. If no, question #4 not applicable.
4. If yes, does it include:
   A. Parameters for which each waste will be analyzed? ___ Yes ___ No
   B. Test methods used to test for these parameters? ___ Yes ___ No
   C. Sampling method used to obtain sample? ___ Yes ___ No
   D. Frequency with which the initial analysis will be reviewed or repeated? ___ Yes ___ No
      1. If yes, does it include requirements to re-test when the process or operation generating the waste has changed? ___ Yes ___ No
   E. (For off-site facilities) Waste analyses that generators have agreed to supply? ___ Yes ___ No
   F. (For off-site facilities) Procedures which are used to inspect and analyze each movement of hazardous waste including:
      1. Procedures to be used to determine the identity of each movement of waste? ___ Yes ___ No
      2. Sampling method to be used to obtain representative sample of the waste to be identified? ___ Yes ___ No

5. Does the facility provide adequate security to minimize the possibility for the unauthorized entry of persons or livestock onto the active portions of the facility? (265.14 - Security) N/. ___ Yes ___

If no, describe inadequacies. (Use narrative explanations sheet.)

If yes, is security provided through:

A. 24-hour surveillance system? (e.g. television monitoring or guards) ___ Yes ___

OR

B. 1. Artificial or natural barrier around facility (e.g. fence or fence and cliff)? Describe type of security ___ Yes ___

AND

2. Means to control entry through entrances (e.g. attendant, television monitors, locked entrance, controlled roadway access)? Describe type of security. ___ Yes ___

Include a drawing indicating any inadequacies in the facility's security system..

6. Is a sign with the legend, "Danger-Unauthorized Personnel Keep Out," posted at the entrance to the active portion of the facility? (265.14 - Security) ___ Yes ___ N

Is it written in English and legible from at least 25 feet? ___ Yes ___ N

(NOTE: The sign must be written in any other language predominant in the area surrounding the facility (e.g. In New Mexico and Texas areas borderin Mexico, the sign must be in Spanish).

If an existing sign with a legend other than "Danger-Unauthorized Personnel Keep Out," what does that legend say?

General Inspection Requirements

7. A. Does the owner/operator maintain a written schedule for inspecting: (265.25 - General Inspection Requirements) X Yes ___ No

1. Monitoring equipment? (If applicable) N/A Yes ___
2. Safety and emergency equipment? MONTHLY INSPECTIONS X Yes ___
3. Security devices? - N/A Yes ___
4. Operating and structural equipment (if applicable) ___ Yes ___
5. Does the schedule or plan identify the types of problems to be looked for during inspection? ___ Yes ___
   a. Malfunction or deterioration (e.g. inoperative sump pump, leaking fitting, eroding dike, corroded pipes or tanks, etc.) ___ Yes ___
   b. Operator error ___ Yes ___
   c. Discharges (e.g. leaks from valves or pipes joint breaks, etc.) ✓ Yes ___

B. Is a written schedule for these inspections maintained at the facility? X Yes ___

   1. Are these inspections conducted? ✓ Yes ___

      a. Is a record of these inspections maintained in the inspection log? X Yes ___

8. Does the owner/operator have an inspection log? (265.15 - General Inspection Requirements) ✓ Yes ___

   A. If yes, does it include:

      1. Date and time of inspection? ✓ Yes ___
      2. Name of inspector? ✓ Yes ___
      3. Notation of observations? ✓ Yes ___
      4. Date and nature of repairs or remedial action? ✓ Yes ___

   B. Are there any malfunctions or other deficiencies noted in the inspection log that remain uncorrected? (Use narrative explanation sheet). ___ Yes X

   C. Are records of the inspection log maintained at the facility for three (3) years? X Yes ___

Personnel Training

9. Does the owner/operator have Personnel Training Records? (265.16 - Personnel Training) NC

NOT NEEDED 3. COMPANY DOES HANDLE HAZAR WASTE.

A. If yes, do they include:

1. Job title and written job description of each position? NA. ___ Yes ___ No

2. Description of type and amount of training? ___ Yes ___ No

3. Records of training given to facility personnel? ___ Yes ___ No

B. Are these records maintained at the facility? ___ Yes ___ No

Requirements for Ignitable, Reactive or Incompatible Waste

10. Does facility handle ignitable or reactive wastes? (265.17 - Ignitable, Reactive, Incompatible Wastes) ___ Yes ___ No

(Circle appropriate type(s) of waste(s).

A. If yes, is waste separated and confined from sources of ignition or reaction, (open flames, smoking, cutting and welding, hot surfaces, frictional heat) sparks (static, electrical or mechanical), spontaneous ignition (e.g. from heat producing chemical reactions) and radiant heat? ___ Yes ___ No

B. Are smoking and open flame confined to specifically designated locations? ___ Yes ___ No

C. Are "No Smoking" signs posted in hazardous areas where ignitable or reactive wastes are handled? ___ Yes ___ No

11. Check containers (265.17 - Ignitable, Reactive, Incompatible Wastes)

A. Are containers leaking or corroding or bulging? (Use narrative explanation sheet to explain containers in this condition.) ___ Yes ___ No

B. Has the facility ever placed incompatible wastes together?
If yes, what were the results? (Use narrative explanation sheet). (Look for signs of mixing of incompatible wastes. e.g., fire, toxic mist, heat generation, bulging containers, etc.) ___ Yes ✓ ___ No

Section 3 - Preparedness and Prevention

1. Is there evidence of fire, explosion or contamination of the environment? (265.31 - Maintenance and operation of facility)

___ Yes _X_ No

If yes, use narrative explanations sheet to explain.

2. Is the facility equipped with (265.32 - Required equipment) SPARK-PROOF AND HORNS

A. Internal communications or alarm system? _X_ Yes ___ No

1. Is it easily accessible in case of emergency? _X_ Yes ___ No

B. Telephone or two-way radio to call emergency response personnel?

_X_ Yes ___ No

C. Portable fire extinguishers, fire control equipment, spill control equipment and decontamination equipment? SPILL CONTROL OIL BOOM

_X_ Yes ___ No

1. Is this equipment tested to assure its proper operation?

_X_ Yes ___ No

D. Water of adequate volume for hoses, sprinklers or water spray system?

1. Describe source of water BAYOU WATER _X_ Yes ___ No

2. Indicate flow rate and/or pressure and storage capacity if applicable. N.A.

3. Is there sufficient aisle space to allow unobstructed movement of personnel and equipment? (e.g. adequate aisle space in between barrels to check for leakage, corrosion and proper labeling, etc.) (265.35 - Required aisle space)

N.A. Yes ___ No

4. Has the owner/operator made arrangements with the local authorities to familiarize them with characteristics of the facility? (layout of facility, properties of hazardous waste handled and associated hazards, places where facility personnel would normally be working, entrances to roads inside facility, possible evacuation routes.) (265.37 - Arrangements with local authorities) _X_ Yes ___ No

If no, has the owner/operator attempted to make such arrangements?

N.A Yes ___ No.

5. In the case that more than one police or fire department might respond, is there a designated primary authority? (265.37 - Arrangements with local authorities)

X Yes ___ No

If yes, indicate primary authority COMPANY SAFETY DIRECTOR.

A. Is the fire department a city or volunteer fire department? CITY

6. Does the owner/operator have phone numbers of and agreements with State emergency response teams, emergency response contractors and equipment suppliers?

Are they readily available to the emergency coordinator? X Yes ___ No

(265.37 - Arrangements with local authorities) X Yes ___ No

7. Has the owner/operator arranged to familiarize local hospitals with the properties of hazardous waste handled and types of injuries that could result from fires, explosions, or releases at the facility? N.A. Yes ___ No

If no, has the owner/operator attempted to do this? N.A Yes ___ No

(265.37 - Arrangements with local authorities)

8. If the State, or local authorities decline to enter into the above referenced agreements, has this situation been entered in the operating record? (265.37 - Arrangements with local authorities) N.A. Yes ___ No

Section C - Contingency Plan and Emergency Procedures

1. Does the facility have a contingency plan? (265.51 - Purpose and implementation of contingency plan.) SEE ATTACHM.

X Yes ___ No

2. Is it maintained at the facility? (265.53 - Copies of contingency plan.)

X Yes ___ No

3. Is the contingency plan a revised SPCC Plan? (265.52 - Content of Contingency plan)

X Yes ___ No

4. Is there an emergency coordinator on site or within short driving distance of the plant at all times? (265.55 - Emergency coordinator)

X Yes ___ No

5. Who is the emergency coordinator? (265.55 - Emergency coordinator) REGGIE LIRETTE

6. Has the facility supplied local police and fire departments with a copy of the contingency plan? (265.52 - Content of contingency plan.)

X Yes ___ No

Section D - Manifest System, Recordkeeping and Reporting

1. Has facility received hazardous waste from off-site since November 19, 1980? (265.71 - Use of manifest system) ___ Yes _

 a. If no, questions 1, 2 and 3 not applicable.

 b. If yes, does the facility retain copies of all manifests? ___ Yes _

  1. Are the manifests signed and dated and returned to the generator? ___ Yes _

  2. Is a signed copy given to the transporter? ___ Yes _

2. Has the facility received any hazardous waste from a rail or water (bulk shipment) transporter since Nov. 19, 1980? (265.71 - Use of manifest system) ___ Yes _

 a. If yes, is it accompanied by a shipping paper ___ Yes _

  1. Does the owner/operator sign and date the shipping paper and return a copy to the generator? ___ Yes _

  2. Is a signed copy given to the transporter? ___ Yes _

3. Has the facility received any shipments of hazardous waste since November 19, 1980, which were inconsistent with the manifest? (265.72 - Manifest discrepancies) ___ Yes _

 a. If yes, has he attempted to reconcile the discrepancy with the generator and transporter? ___ Yes _

  1. If no, has Regional Administrator been notified? ___ Yes _

4. Has the facility received any waste (that does not come under the small generator exclusion) not accompanied by a manifest? (265.76 - Unmanifested waste report) ___ Yes _

 a. If yes, has he submitted an unmanifested waste report to the Regional Administrator? ___ Yes _

5. Does the facility have a written operating record? (265.73 - Operating record) ___ Yes _

 a. Is a copy maintained at the facility? ___ Yes _

5. b. Does the record include:

1. Description and quantity of each hazardous waste received and the methods and dates of its treatment, storage or disposal at the facility? ___ Yes

2. Location and quantity of each hazardous waste at each location? ___ Yes

   a. Is this information cross-referenced with the manifest which was included with that hazardous waste shipment? ___ Yes

3. (For disposal facilities only) Is the location and quantity of each hazardous waste recorded on a map or diagram of each cell or disposal area? ___ Yes

4. Record and results of waste analyses? ___ Yes

5. Reports of incidents involving implementation of the contingency plan? (If applicable) ___ Yes

6. Records and results of required inspections since November 19, 1980? ___ Yes

7. Monitoring, testing or analytical data where required? ___ Yes ___ No

8. Closure cost estimates and for disposal facilities, post-closure cost estimates? (effective May 19, 1981.) ___ Yes

9. Handling codes for treatment, storage and disposal methods? ___ Yes

10. Physical forms of the wastes? ___ Yes

11. Processes that produce the wastes? ___ Yes

12. For wastes containing more than one listed waste or waste characteristic, all applicable EPA Hazardous Waste Numbers and the quantities of each constituent waste? ___ Yes

Section E - Plans and Reports

1. Have all plans and reports been visually inspected and /or been made available for inspection? (265.74 - Availability, retention and disposition of records) X Yes

List plans and/or reports not made available for inspection.

NONE

2. Did operator provide inspector with a drawing of the facility? X Yes

   a. If yes, please indicate which are hazardous waste facilities on the drawing.

3. Indicate types of hazardous waste facilities.

   ____ ~~Containers~~
   ____ Tanks
   ____ Surface Impoundments
   ____ Waste Piles
   ____ Land Treatment
   ____ Landfill
   ____ Incinerator
   ____ Thermal Treatment
   ____ Chemical, Physical and Biological Treatment

SEE NARRATIVE SHEET

Section F - Groundwater Monitoring

1. Are there any ground water monitoring wells? (265.90 Applicability) X Yes

   a. Is owner/operator aware that prior to 11/19/81 he must install, operate and maintain a groundwater monitoring system (unless waived in writing)? X Yes

Please print or type with ELITE type (12 characters/inch) in the unshaded areas only.

Form Approved OMB No. 158-S79016
GSA No. 0246-EPA-OT

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTALLATION'S EPA I.D. NO.	LA D058475419
I. NAME OF INSTALLATION	Delta Shipyard, Inc.
II. INSTALLATION MAILING ADDRESS	P.O. Box 7036 Houma, Louisiana 70361 PLEASE PLACE LABEL IN THIS SPACE
III. LOCATION OF INSTALLATION	Hwy. 661 Houma, Louisiana 70361

INSTRUCTIONS: If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

DETACH

FOR OFFICIAL USE ONLY

COMMENTS

C

INSTALLATION'S EPA I.D. NUMBER	T/A	C	APPROVED	DATE RECEIVED (yr., mo., & day)
F LAD058475419		1		

I. NAME OF INSTALLATION

Delta Shipyard Inc.

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX

3 PO Box 7036

CITY OR TOWN	ST.	ZIP CODE
4 Houma	LA	70361

MAR 11 1983

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER

5 Industrial Blvd. Hwy. 661

CITY OR TOWN	ST.	ZIP CODE
6 Houma	LA	70361

IV. INSTALLATION CONTACT

NAME AND TITLE (last, first, & job title)	PHONE NO. (area code & no.)
2 Olivier Chris Vice-President	504-868-7450

V. OWNERSHIP

A. NAME OF INSTALLATION'S LEGAL OWNER

8 Delta Service Industries, Inc.

DETACH

B. TYPE OF OWNERSHIP (enter the appropriate letter into box)

F = FEDERAL
M = NON-FEDERAL

M

VI. TYPE OF HAZARDOUS WASTE ACTIVITY (enter "X" in the appropriate box(es))

- [ ] A. GENERATION
- [ ] B. TRANSPORTATION (complete item VII)
- [X] C. TREAT/STORE/DISPOSE
- [ ] D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION (transporters only – enter "X" in the appropriate box(es))

- [ ] A. AIR
- [ ] B. RAIL
- [ ] C. HIGHWAY
- [ ] D. WATER
- [ ] E. OTHER (specify):

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below.

- [ ] A. FIRST NOTIFICATION
- [X] B. SUBSEQUENT NOTIFICATION (complete item C)

C. INSTALLATION'S EPA I.D. NO.

LAD058475419

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

EPA Form 8700-12 (6-80)

I.D. – FOR OFFICIAL USE ONLY		
W		T/A C 1

IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
7	8	9	10	11	12

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

D. LISTED INFECTIOUS WASTES. Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

☐ 1. IGNITABLE (D001) ☐ 2. CORROSIVE (D002) ☐ 3. REACTIVE (D003) ☐ 4. TOXIC (D000)

DETACH

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE *(type or print)*	DATE SIGNED
Horace J. Thibodaux R.S.	Horace J. Thibodaux, R.S., Authorized Representative of Delta Shipyard, Inc.	2/7/83

EPA Form 8700-12 (6-80) REVERSE

8/2/-27

EPA POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

REGION	SITE NUMBER (to be assigned by Hq)
6	LA01317

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: DELTA SHIPYARD (Formerly a division of Delta Ironworks)

B. STREET (or other identifier): Industrial Blvd.

C. CITY: Houma | D. STATE: LA | E. ZIP CODE: 70360 | F. COUNTY NAME: Terrebonne Parish

G. SITE OPERATOR INFORMATION

1. NAME: Ralph Arceneaux, Vice President | 2. TELEPHONE NUMBER: (504)868-7450

3. STREET: Industrial Blvd. | 4. CITY: Houma | 5. STATE: LA | 6. ZIP CODE: 70360

H. REALTY OWNER INFORMATION (if different from operator of site)

1. NAME: Leon Toups, President, Delta Services Industries | 2. TELEPHONE NUMBER: (504)868-7450

3. CITY: Houma (P. O. Box 101) | 4. STATE: LA | 5. ZIP CODE: 70361

I. SITE DESCRIPTION: See Attachment "A"

J. TYPE OF OWNERSHIP: ☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.):

B. APPARENT SERIOUSNESS OF PROBLEM: ☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE

C. PREPARER INFORMATION

1. NAME: Deborah Vaughn | 2. TELEPHONE NUMBER: (214)742-4521 | 3. DATE (mo., day, & yr.): 3/11/81

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME: Deborah A. Vaughn *Deborah A. Vaughn* | 2. TITLE: FIT, Geologist

3. ORGANIZATION: Ecology & Environment, Inc., 1509 N. Main, Suite 814, Dallas, TX 75201 | 4. TELEPHONE NO. (area code & no.): (214)742-4521

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Gordon Duncan	Ecology & Environment	(214)742-4521
		LAD 058 475419

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
Leon Toups	President (504)868-7450	Industrial Blvd., Houma, LA 70360
Louis E. Talbot	Exec. Vice President, Delta Svcs. (504)868-7450	" " "
Ralph Arceneaux	Vice President (504)868-7450	" " "
Chris Olivier	Engineer, Delta Shipyard (504)868-7450	" " "

SUPERFUND FILE

APR 30 1992

REORGANIZED

(4-16-81)

REVIEWED BY (6ASASC): [signature] DATE 4/20/81

REFERENCE 9

~~88526~~

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL
2. PHOTOS IN CUSTODY OF: EPA Region VI (see attached photos)

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: EPA Region VI (see attached map and sketches)

E. COORDINATES

1. LATITUDE (deg.-min.-sec.)	2. LONGITUDE (deg.-min.-sec.)
29°34'02" N	90°42'18" W

V. SITE INFORMATION

A. SITE STATUS

[X] 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*

[ ] 2. INACTIVE *(Those sites which no longer receive wastes.)*

[ ] 3. OTHER *(specify)*: *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES *(specify generator's four-digit SIC Code)*: 3731, 3732

C. AREA OF SITE *(in acres)*: Approx. 40

D. ARE THERE BUILDINGS ON THE SITE? [ ] 1. NO [X] 2. YES *(specify)*:

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP	X	2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
X	4. TRUCK	X	4. TANK, ABOVE GROUND	X	4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[X] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [X] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [ ] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [X] 2. IGNITABLE [ ] 3. RADIOACTIVE [X] 4. HIGHLY VOLATILE

[ ] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE

[ ] 9. OTHER *(specify)*:

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes. Manifests and records are kept at the shipyard office.

Continued From Page 4

VIII. HAZARD DESCRIPTION (continued)

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☐ E. CONTAMINATION OF FOOD CHAIN

☒ F. CONTAMINATION OF GROUND WATER

Contamination of ground water could occur due to infiltration of oil contaminated waters generated in the oil/water separation process. This contamination should be minimal because soil permeabilities at the site are very low (10^{-7} to 10^{-8} cm/sec). See Attachment "C". Sampling of monitoring wells would determine whether contamination has occurred.

☐ G. CONTAMINATION OF SURFACE WATER

Continue On Reverse

Continued From Page 6

VIII. HAZARD DESCRIPTION *(continued)*

☐ N. FIRE OR EXPLOSION

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☐ Q. EROSION PROBLEMS

☐ R. INADEQUATE SECURITY

☐ S. INCOMPATIBLE WASTES

Continue On Reverse

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
None				

I. RECEIVING WATER

1. NAME
Houma Navigation Canal

☐ 2. SEWERS
☒ 3. STREAMS/RIVERS
☐ 4. LAKES/RESERVOIRS
☐ 5. OTHER(specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS
Fish, wildlife and other aquatic and semi-aquatic life, secondary contact recreations.
Part of the Terrebonne Watershed.

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☐ A. KNOWN FAULT ZONE
☐ B. KARST ZONE
☒ C. 100 YEAR FLOOD PLAIN
☒ D. WETLAND
☒ E. A REGULATED FLOODWAY
☐ F. CRITICAL HABITAT
☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	'X'	C. OTHER (specify below)
X					
	1. SAND	X	Quaternary Terrace & Alluvial Deposits		
X	2. CLAY	X	"		
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN
☐ B. VERY HIGH (100,000 to 1000 cm/sec.)
☐ C. HIGH (1000 to 10 cm/sec.)
☐ D. MODERATE (10 to .1 cm/sec.)
☐ E. LOW (.1 to .001 cm/sec.)
☒ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA
X 1. YES ☐ 2. NO 3. COMMENTS: Only in that it is a coastal wetland.

H. DISCHARGE AREA
X 1. YES ☐ 2. NO 3. COMMENTS: Only in that it is a coastal wetland.

I. SLOPE

1. ESTIMATE % OF SLOPE: 0 -.5%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.: South

J. OTHER GEOLOGICAL DATA
See Attachment "C"

STORAGE FACILITIES SITE INSPECTION REPORT (Supplemental Report)	INSTRUCTION Answer and Explain as Necessary.

1. STORAGE AREA HAS CONTINUOUS IMPERVIOUS BASE

[X] YES [ ] NO

2. STORAGE AREA HAS A CONFINEMENT STRUCTURE

[X] YES [ ] NO

3. EVIDENCE OF LEAKAGE/OVERFLOW *(If "Yes", document where and how much runoff is overflowing or leaking from containment)*

[ ] YES [X] NO

4. ESTIMATE TYPE AND NUMBER OF BARRELS/CONTAINERS

5 above ground storage tanks for recycled oil. See photos 1 & 5.

5. GLASS OR PLASTIC STORAGE CONTAINERS USED

[ ] YES [X] NO

6. ESTIMATE NUMBER AND CAPACITY OF STORAGE TANKS

Approx. 100,000 gallons.

7. NOTE LABELING ON CONTAINERS

Storage tanks are labeled with safety notices.

8. EVIDENCE OF LEAKAGE CORROSION OR BULGING OF BARRELS/CONTAINERS/STORAGE TANKS *(If "Yes", document evidence. Describe location and extent of damage. Take PHOTOGRAPHS)*

[ ] YES [X] NO

9. DIRECT VENTING OF STORAGE TANKS

[X] YES [ ] NO

10. CONTAINERS HOLDING INCOMPATIBLE SUBSTANCES *(If "Yes", document evidence. Describe location and identity of hazardous waste. Take PHOTOGRAPHS.)*

[ ] YES [X] NO

11. INCOMPATIBLE SUBSTANCES STORED IN CLOSE PROXIMITY *(If "Yes", document evidence. Describe location and identity of hazardous waste. Take PHOTOGRAPHS.)*

[ ] YES [X] NO

12. ADEQUATE CONTAINER WASHING AND REUSE PRACTICES

[X] YES [ ] NO

13. ADEQUATE PRACTICES FOR DISPOSAL OF EMPTY STORAGE CONTAINERS

[X] YES [ ] NO Non-disposable storage containers.

SURFACE IMPOUNDMENTS SITE INSPECTION REPORT
(Supplemental Report)

INSTRUCTION
Answer and Explain as Necessary.

1. TYPE OF IMPOUNDMENT
Two identical impoundments in filled marsh area. See photo #5.

2. STABILITY/CONDITION OF EMBANKMENTS
Good. See photo #4.

3. EVIDENCE OF SITE INSTABILITY *(Erosion, Settling, Sink Holes, etc.)*
☐ YES ☒ NO

4. EVIDENCE OF DISPOSAL OF IGNITABLE OR REACTIVE WASTE
☐ YES ☒ NO

5. ONLY COMPATIBLE WASTES ARE STORED OR DISPOSED OF IN THE IMPOUNDMENT
☒ YES ☐ NO

6. RECORDS CHECKED FOR CONTENTS AND LOCATION OF EACH SURFACE IMPOUNDMENT
☐ YES ☒ NO

7. IMPOUNDMENT HAS LINER SYSTEM
☐ YES ☒ NO

7a. INTEGRITY OF LINER SYSTEM CHECKED
☐ YES ☐ NO N/A

7b. FINDINGS
Subsurface soils have permeability of 10^{-7} to 10^{-8} cm/sec. See Attachment "C".

8. SOIL STRUCTURE AND SUBSTRUCTURE
Medium gray organic clay at surface to soft gray silty clay with sand traces at 40 to 50 feet.

9. MONITORING WELLS
☒ YES ☐ NO Two (2) wells installed. (See Attachment "C" - monitoring well logs.)

10. LENGTH, WIDTH, AND DEPTH
LENGTH 75' (each) WIDTH 40' (each) DEPTH 5' (each) Two impoundments.

11. CALCULATED VOLUMETRIC CAPACITY
15,000 $ft.^3$

12. PERCENT OF CAPACITY REMAINING
30%

13. ESTIMATE FREEBOARD
1.5 ft.

14. SOLIDS DEPOSITION
☒ YES ☐ NO Low solids deposited.

15. DREDGING DISPOSAL METHOD
Unknown

16. OTHER EQUIPMENT

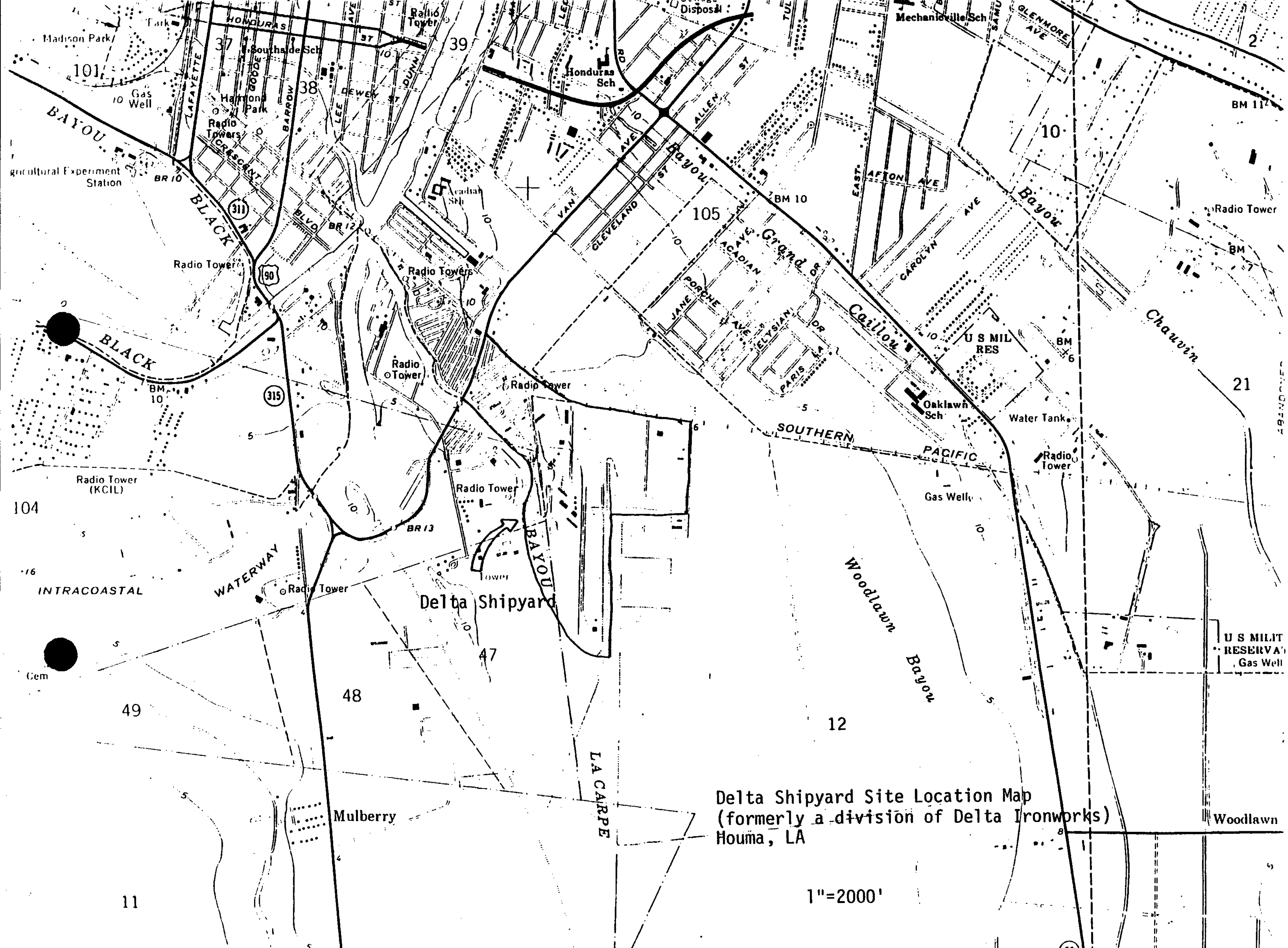
EPA Form T2070-3C (10-79)

ATTACHMENT A

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT SUPPLEMENT SHEET

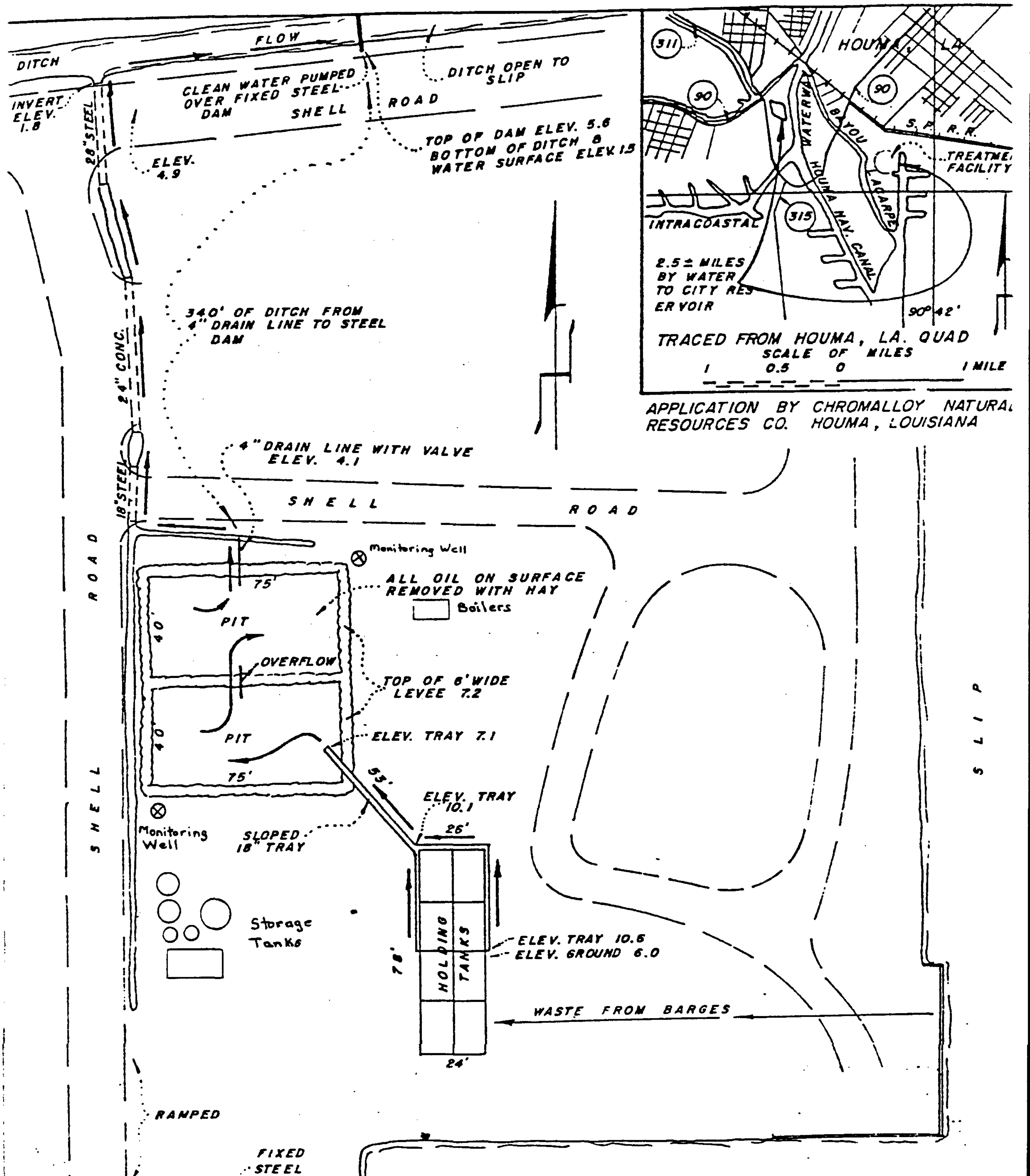
Instruction - This sheet is provided to give additional information in explanation of a question on the form T2070-3.

Corresponding number on form	Additional Remark and/or Explanation
I, i.	Delta Ironwords was a large industrial park (approximate 165 acres located on Industrial Blvd. in southeast Houma, LA. . The corporation of Delta Ironworks owned and operated 7 divisions, all located within the Delta Ironworks industrial facilities. These 7 divisions were: (1) Delta Shipyard - repair and painting of ships. (2) Delta Fabrication - produces offshore oil support equipment (platforms). (3) Delta Construction - produces pipes. (4) Delta Safety & Supply - distributes safety equipment and constructs fire safety equipment. (5) Heldenbrand - inspection, repair and modification of drill pipes. (6) Delta mud & chemical - distributor of drilling muds. (7) Gemoco - construction of offshore oil drill support equipment In 1969, Delta Ironworks was sold to Chromalloy American Corp., St. Louis, MO. Chromalloy maintained all 7 divisions until 1980. In November 1980 Chromalloy sold 5 of the divisions to Delta Services Industries, keeping Delta Mud & Chemical and Gemoco. At the present time the old Delta Ironworks (LA 01317) area houses the same 7 divisions listed above, but has two owners: (1) Delta Services Industries, Houma, LA and (2) Chromalloy American Corp.,M Upon inspecting the facilities, the FIT representatives found that only Delta Shipyard, owned by Delta Services Industries, may deal with hazardous wastes that could potentially pose a contamination problem. Delta Shipyard consists of cleaning and repair facilities for smal cargo and fishing vessels. Before any repair work may commence th vessels must be certified vapor free by the Coast Guard. The vessels are steam cleaned and the oily wastes are removed. The generated oils and waste waters are sent through a separation process after which the waste oil is recovered and sold. The wastes are stored in evaporation ponds (surface impoundments).
III, E.	Clayton L. Holden, P.O. Box 151, Chalmette, LA. (no longer used because he refuses to handle a manifest), Oily Wastes J & L Oils, P. O. Box 209, Geismar, LA 70734, (504)673-6785, Oily Wastes M. K. Fuels, Inc., P. O. Box 2802, Baton Rouge, LA 70821, (504)343-4662, Oily Wastes



Delta Shipyard Site Location Map
(formerly a division of Delta Ironworks)
Houma, LA

1"=2000'



APPLICATION BY CHROMALLOY NATURAL RESOURCES CO. HOUMA, LOUISIANA

WASH WASTE TREATMENT FACILITY

5.3.3.A 1

SCALE: 1" = 50' FEB. 6, 1980 SHEET 1 OF 1

SOIL TESTING ENGINEERS, INC.
CONSULTING GEOTECHNICAL ENGINEERS
P. O. BOX 80379 • 316 HIGHLANDIA DRIVE • BATON ROUGE, LOUISIANA 70808 • PHONE (504) 292-4790

P BOUTWELL, JR. PHD
B ADAMS, ME
L BRYANT, ME
DERICK, MS
PROFESSIONAL ENGINEERS
BROWN, MS

November 26, 1980

T. Baker Smith and Sons, Inc.
Environmental Research Division
P. O. Box 2266
Houma, Louisiana 70361

Attention: Mr. Horace J. Thibodaux, RS
Director of Environmental Research

Re: Preliminary Soil Borings
and Laboratory Testing
Delta Shipyard Disposal Pit
Houma, Louisiana
File: 80-173

Gentlemen:

We have completed the field work and laboratory tests performed on samples obtained from two borings completed during the period November 3 and 4, 1980, at the Delta Shipyard disposal pit. Additionally, two observation wells with caps, were installed close to the borings (see Figure 2). The findings of the borings and the results of the laboratory testing are presented herein. The approximate locations of the borings are shown on the Boring Plan, Figure 1. The soil data on this cross section has been interpolated between the borehole locations and does not define continuity of the strata. For details, refer to the individual logs of the borings. The field and laboratory procedures used in this investigation are discussed below.

It should be noted that a geotechnical/geologic report was not requested at this stage. If such a report is later required, then necessary additional borings and testing, as well as engineering analyses can be performed.

FIELD EXPLORATION

General. The borings were made with tractor-mounted, rotary-type drilling equipment. Samples were obtained continuously in the upper 20 feet; below the 20 foot level, samples were generally obtained on 3 to 5 foot centers. The total exploration program consisted of 100 lineal feet of borings, 40 feet of which were sampled continuously. Logs of the borings are attached. The boreholes were grouted with a thick bentonite/cement grout. Two observation wells were installed as indicated on the Monitoring Well logs (W-1 and W-2) and Figure 1.

ATTACHMENT C

Sampling Procedures. In the cohesive and semi-cohesive soils, relatively undisturbed samples were secured using a 3 inch diameter, thin-wall Shelby Tube sampler. In this sampling procedure, the borehole is advanced to the desired level, and the tube is lowered to the bottom of the boring. It is then forced about 2 feet into the undisturbed soil in one continuous stroke. The tube is retrieved and the sample extruded by a hydraulic piston. The sample is then visually classified and a penetrometer relative strength test performed. Any disturbed portions are discarded, and the sample protected for transportation to the laboratory.

LABORATORY PROCEDURES

Some samples from the various strata were tested in the laboratory to determine their classifications and permeability characteristics. The samples and types of tests performed were selected by a geotechnical engineer. The testing program conducted is described below.

Classification Tests. Thirteen (13) Atterberg Limit Determinations, and one Separate Moisture Content Determination were conducted to classify the soil types.

Consolidation/Permeability Tests. Two (2) Standard Consolidation tests were performed. These were used in determining the Coefficient of Permeability of fine grained soils. The results are given below.

Boring No.	Depth (feet)	Perm. Coef. (cm/sec.)	Soil Description
B-1	6-8	4.3×10^{-8}	Gray organic clay
B-2	12-14	1.2×10^{-7}	Dark gray organic clay (peat)

Chemical Tests. Fourteen (14) pH determinations were performed to determine soil acidity/alkalinity. The results are give on Table I.

The results of the consolidation test are presented on Figure A-I through A-II; the remainder of the testing program is summarized in the appropriate columns of the boring logs.

We will be happy to answer any questions which may arise concerning this information. It has been a pleasure to work with Mr. Thibodaux on this project, and we look forward to serving T. Baker Smith and Sons again in the future.

Sincerely,

Narendra Dave

Narendra M. Dave
Project Engineer

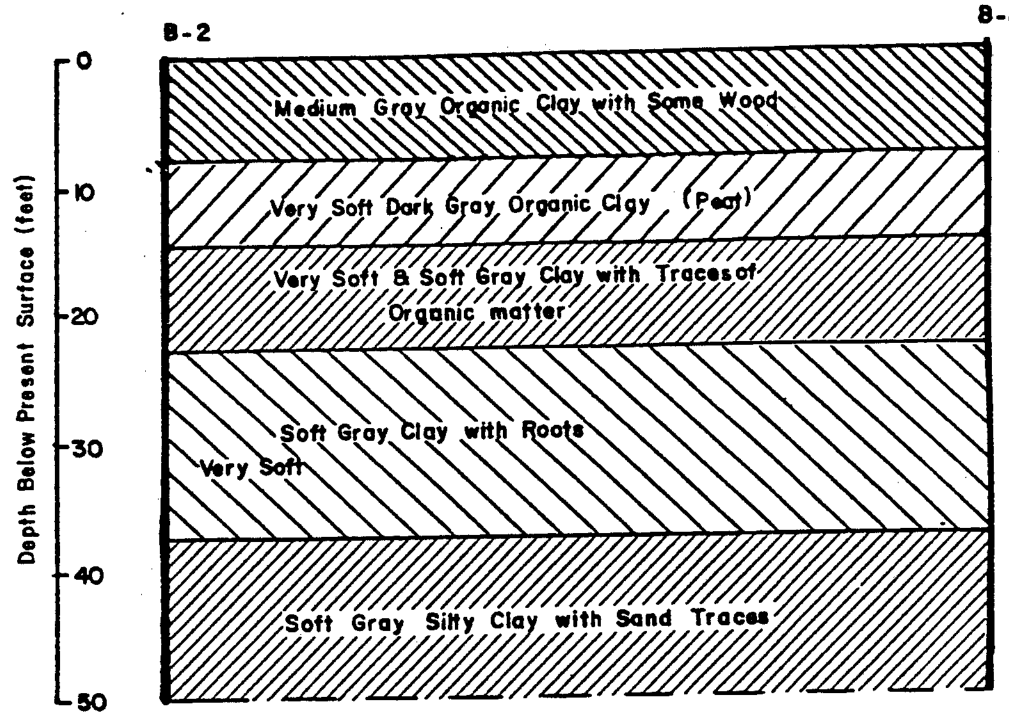
Richard B. Adams

Richard B. Adams, P.E.

/llt

Enclosures

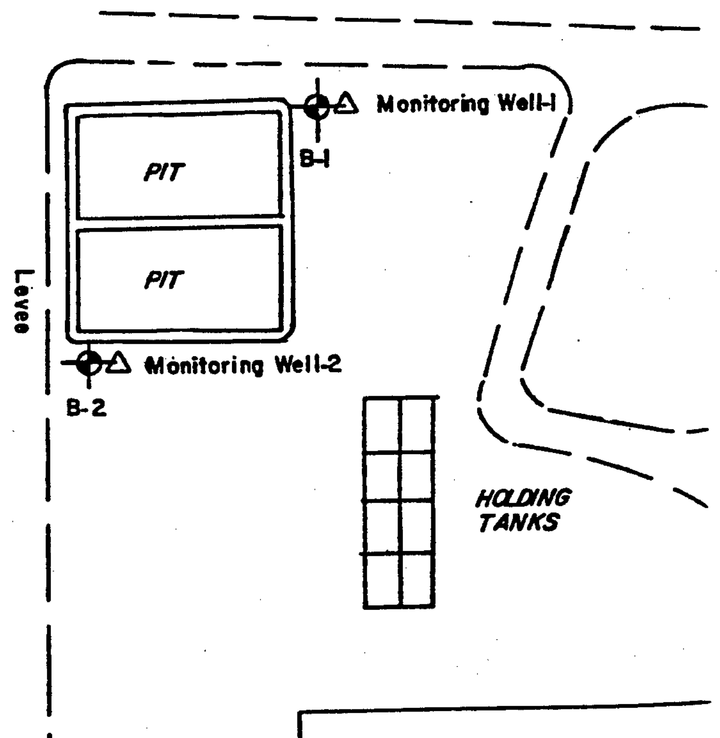
Copies submitted: (4)



SOIL PROFILE

No Horiz. Scale

NOTE:
Strata interpolated betw
not define continuity be



BORING PLA

No Scale

SOIL BORING LOG

Project: Delta Disposal Pit, Houma, Louisiana
Client: T. Baker Smith & Sons, Inc., Houma, Louisiana

Boring No. B-2
Sheet 1 of 2

File No. 80-173
Date 11/04/80
Tech. A. Kahn

Boring Advance Method:
Auger 0' to 2'
Wash 2' to 50'

Depth (feet)	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq.ft)	Compressive Strength (tons/sq.ft.)	Moisture Content (%)	Dry Density (lbs./cu.ft.)	Liquid Limit (%)	Plasticity Index (%)	Description
	1.2 (P)		41		107	68	Medium gray organic clay, w/some wood
	0.7 (P)		54		101	54	
5	0.6 (P)						
	N.P.						
	0.3 (P)		131		154	107	Very soft dark gray organic clay (peat)
10	0.3 (P)						
	0.4 (P)		110		284	162	
15	0.5 (P)						Soft gray clay, w/traces of organic matter
	0.2 (P)						
20	1.2 (P)		39		88	60	
25	0.5 (P)						Soft gray clay, w/wood & roots
30	0.4 (P)						
35	0.1 (P)		35		63	38	--very soft
40	0.3 (P)						Soft gray silty clay, w/sand traces

Standard Penetration Test - 140 lb. hammer - 30" fall
Undisturbed Sample - 3in. dia. Shelby Tube
No Recovery
Compressive Strength from Unconfined Compression Test Unless Noted Otherwise
Strata Boundaries May Not Be Exact

▽ Free Water First Encountered
▽ Water Level After 10 minutes (Prior to Wash Boring)

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project	Delta Disposal Pit Houma, Louisiana
Client	T. Baker Smith & Sons, Inc. Houma, Louisiana
Boring No.	B-2
Sheet	2 of 2
File No.	80-173
Date	11/04/80
Tech.	Chenevert

FIELD DATA				LABORATORY DATA					
Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq.ft)	Compressive Strength (tons/sq.ft.)	Moisture Content (%)	Dry Density (lbs./cu.ft.)	Liquid Limit (%)	Plasticity Index (%)	
									Soft gray silty clay, w/sand traces
	45		0.3 (P)		32		35	9	
	50		0.7 (P)						
									Boring terminated @ 50'

SYMBOL

Standard Penetration Test 140 lb. hammer-30" fall

Undisturbed Sample 3in. dia. Shelby Tube

No Recovery

Compressive Strength from Unconfined Compression Test Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

MONITORING WELL LOG

Boring No. W-1

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

File No. 80-173
Date 11/03/80
By Chenevert

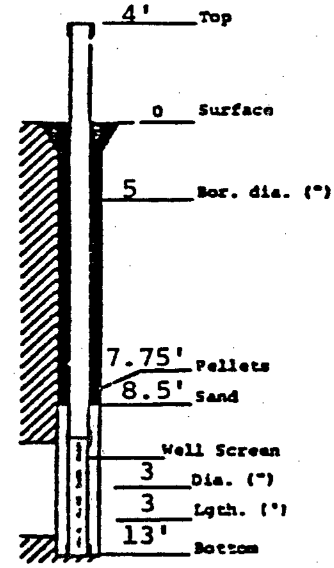
Boring Advance Method: Wash 0' to 12'

Drill Rig: 200
Driller: James Kelly

FIELD DATA				
WATER LEVELS	DEPTH (feet)	SAMPLING	Standard Penetration Test (blows/foot) or Penetrometer (P) - Torvane (T) (tons/sq ft)	
	5			SEE BORING B-1
	10			
				Boring terminated @ 12'

Monitoring Well Data

Well No. 1



Standard Penetration Test 140 lb hammer - 30 in fall

Undisturbed Sample 3 in dia Shelby Tube

No Recovery

Strata boundaries inferred and may not be exact

SOIL TESTING ENGINEERS, INC

MONITORING WELL LOG

Boring No. W-2

Project: Delta Disposal Pit
Houma, Louisiana

Client: T. Baker Smith & Sons, Inc.
Houma, Louisiana

File No. 80-173
Date 11/04/80
By Chenevert

FIELD DATA

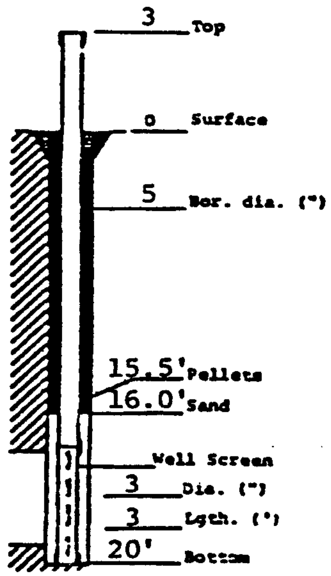
Boring Advance Method: Wash 0' to 20'

Drill Rig: 200
Driller: James Kelly

Water Levels	DEPTH (feet)	Sampling	Standard Penetration Test (blows / foot) or Penetrometer (P) - Torvane (T) (tons / sq ft)	Description
	5			SEE BORING B-2
	10			
	15			
	20			Boring terminated @ 20'

Monitoring Well Data

Well No. 2



Standard Penetration Test 140 lb hammer - 30 in fall

Undisturbed Sample 3 in dia Shelby Tube

No Recovery

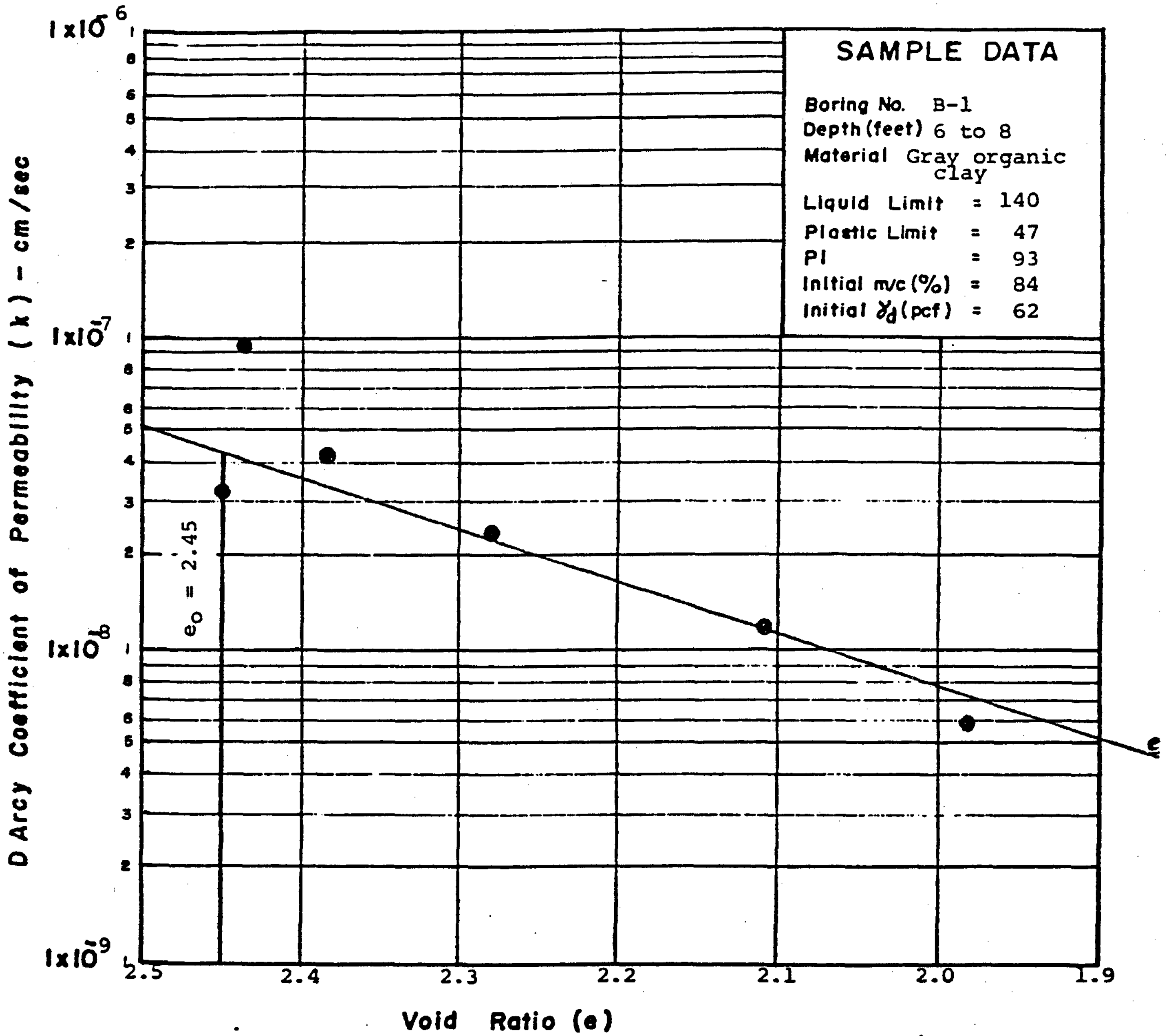
Strata boundaries inferred and may not be exact

SOIL TESTING ENGINEERS, INC

TABLE I

CHEMICAL ANALYSIS

Boring No.	Depth (feet)	pH
1	2.0 to 4	7.3
1	6.0 to 8	7.9
1	10.0 to 12	5.9
1	16.0 to 18	7.3
1	28.0 to 30	8.2
1	38.0 to 40	8.1
2	0 to 2	6.8
2	4.0 to 6	7.7
2	8.0 to 10	7.5
2	12.0 to 14	6.3
2	18.0 to 20	8.0
2	33.0 to 35	8.0
2	43.0 to 45	8.0



$$k = C_v \gamma_w \frac{\Delta e / \Delta \sigma}{1 + e_o}$$

● Raw Data Point

—— Best Fit Linear Regression in Stable Range

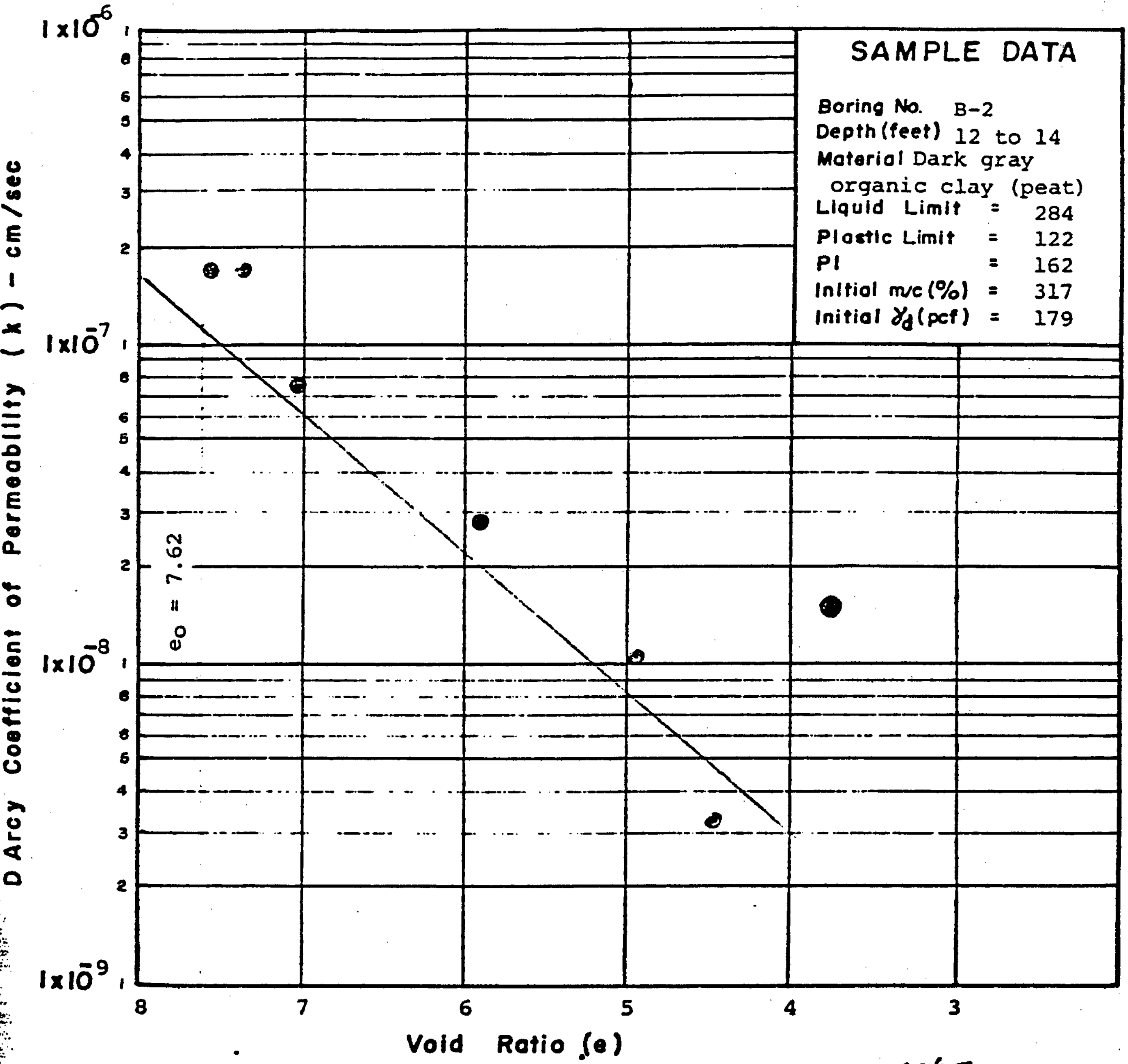
C_v = Coeff. of Consolidation
Δe = Change in Void Ratio
$\Delta \sigma$ = Change in Pressure
γ_w = Unit Weight of Water

$k = 4.3 \times 10^{-8}$ cm/sec at e_o = 2.45

PERMEABILITY DETERMINED BY CONSOLIDATION TEST

Delta Shipyard Disposal Pit
Houma, Louisiana

80-173
Figure A-IB



$$k = C_v \gamma_w \frac{\Delta e / \Delta \sigma}{1 + e_o}$$

● Raw Data Point

—— Best Fit Linear Regression in Stable Range

C_v = Coeff. of Consolidation
Δe = Change in Void Ratio
$\Delta \sigma$ = Change in Pressure
γ_w = Unit Weight of Water

$k = 1.2 \times 10^{-7}$ cm/sec at $e_o = 7.62$

PERMEABILITY DETERMINED BY CONSOLIDATION TEST

Delta Shipyard Disposal Pit
Houma, Louisiana

80-173
Figure A-II[B]

Photographer / Witness PHOTO #1

[illegible] / D. Vaugh[illegible]

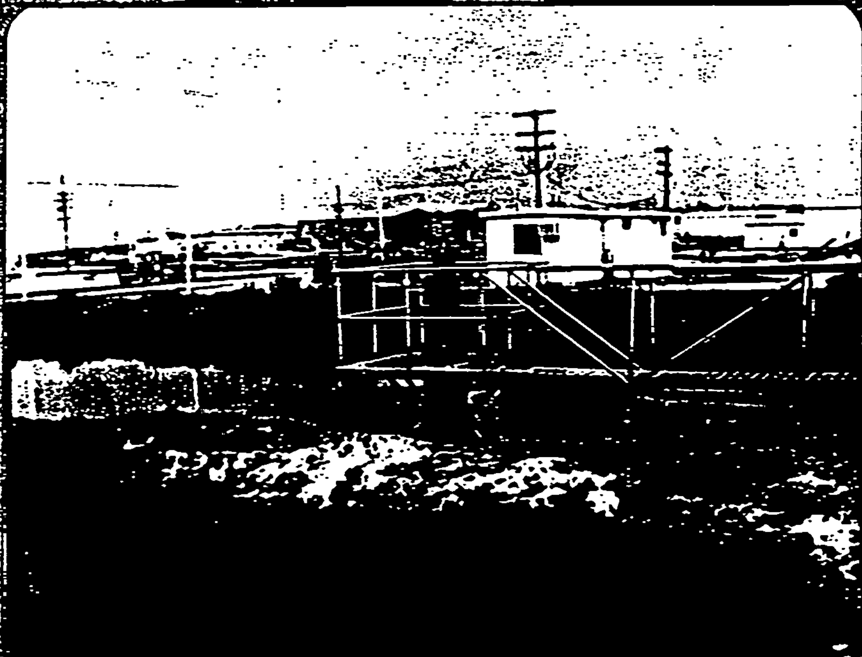
Date / Time / Direction

[illegible]

Comments: [illegible]

[illegible]

[illegible]



Photographer / Witness PHOTO 2

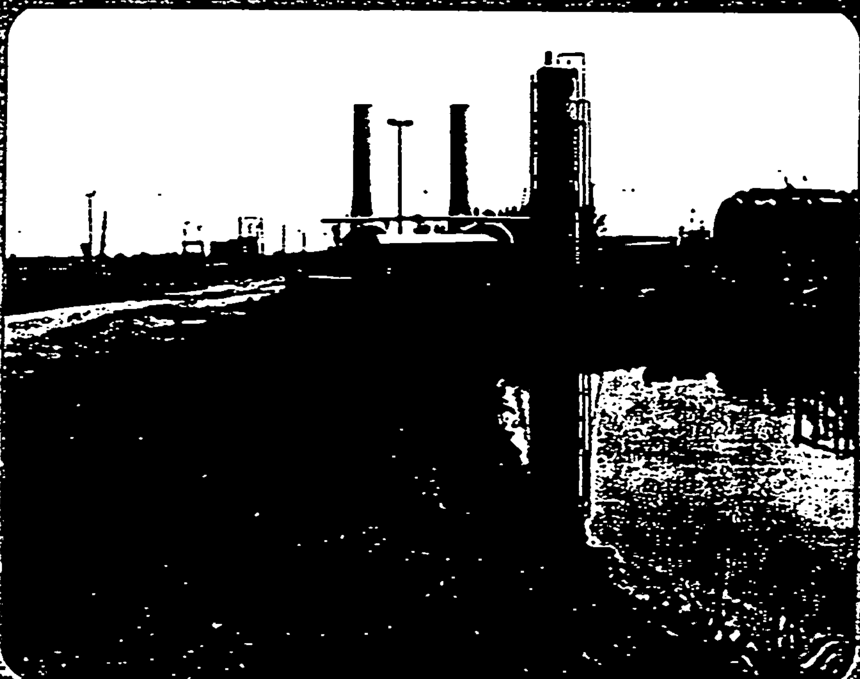
[illegible]

Date / Time / Direction

[illegible]

Comments: [illegible]

[illegible]



Photographer / Witness PHOTO 3

[illegible]

Date / Time / Direction

[illegible]

Comments: [illegible]

[illegible]

[illegible]

Photographer / Witness PHOTO #4

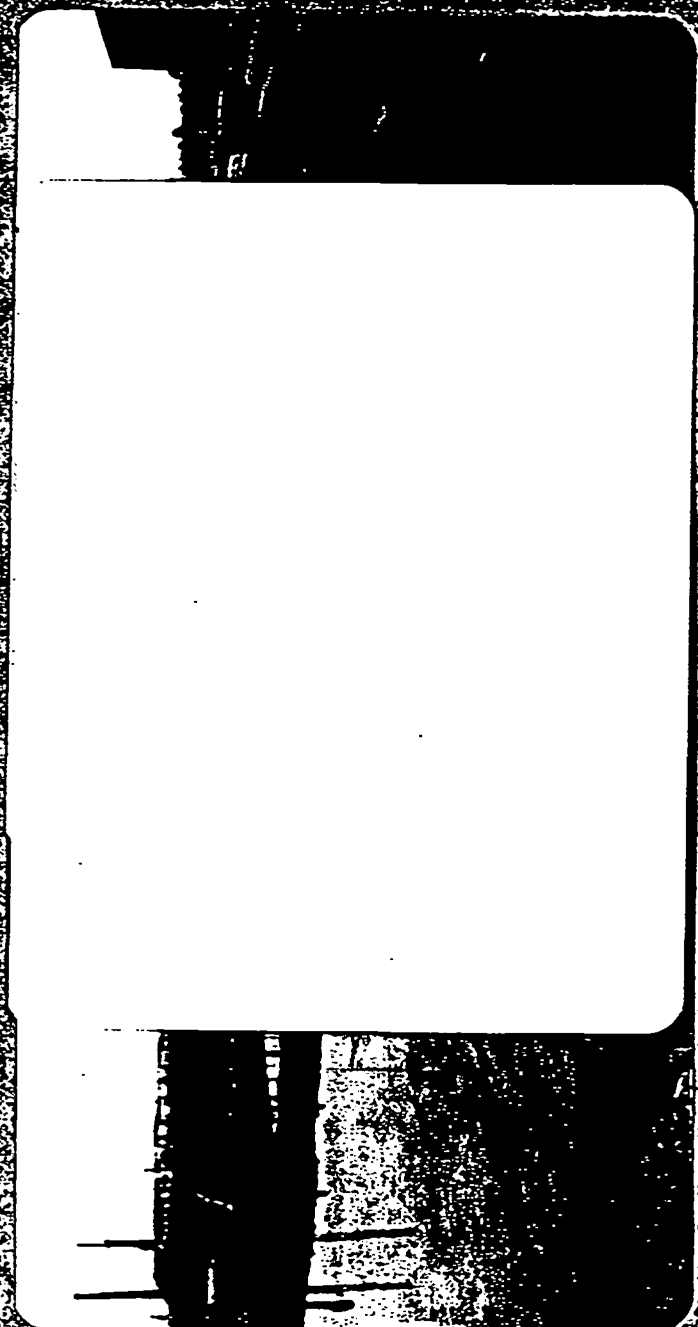
G. Duncan / D. Vaughn

Date / Time / Direction

3-11-81 / 11:10 / W

Comments: View of both

pits and [illegible]



Photographer / Witness PHOTO #5

[illegible]

Date / Time / Direction

[illegible]

Comments: [illegible]

[illegible]

[illegible]

Photographer / Witness

Date / Time / Direction

Comments:

REFERENCE 10

~~88527~~

State of Louisiana

FRANK P. SIMONEAUX
SECRETARY
B. JIM PORTER
ASSISTANT SECRETARY

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF ENVIRONMENTAL AFFAIRS

GERALD D. HEALY, JR.
ADMINISTRATOR

HAZARDOUS WASTE MANAGEMENT DIVISION

May 20, 1983

CERTIFIED RETURN RECEIPT REQUESTED (330 795)

Mr. Christian Olivier
Delta Shipyard (GD-343)
Post Office Box 101
Houma, Louisiana 70361

Dear Mr. Olivier:

Re: NOTICE OF VIOLATION

On May 10, 1983, a Hazardous Waste Specialist from the Louisiana Hazardous Waste Management Division performed an inspection to determine the degree of compliance with the Louisiana Hazardous Waste Management Plan.

During the course of the inspection, the following violations were noted:

1. Contrary to amended Section 5.4.2 C. of the Hazardous Waste Management Plan, the manifests lacked proper E.P.A. identification number for generator, transporter, and disposer.

2. Contrary to Section 5.4.3 A. of the Hazardous Waste Management Plan, the generator had not filled out the name and address of the transporter, storer, or disposal facility.

3. Contrary to Section 5.4.4 D. of the Hazardous Waste Management Plan, the generator did not provide an emergency card or a statement concerning the hazardous nature of the material involved.

4. Contrary to Section 5.5.2 A. of the Hazardous Waste Management Plan, the facility owner/operator has not developed or implemented a waste analysis plan.

5. Contrary to amended Section 6.1.4 of the Hazardous Waste Management Plan, when the generator's second (green) copy of the manifest was not returned to generator within 35 days of shipment, no evident action was taken, nor was an Exception Report filed with the Department.

6. Contrary to Section 6.6 of the Hazardous Waste Management Plan, there was no indication that this facility was having their waste treated, stored, or disposed of at a hazardous waste facility permitted under these regulations.

7. Contrary to Section 7.1.1 of the Hazardous Waste Management Plan, the generator offered for transportation hazardous waste to a transporter without Department of Public Safety (see Section 7.5.1) approval.

8. Contrary to amended Section 8.4.10 A.2) of the Hazardous Waste Management Plan, this facility has not developed and adhered to a groundwater sampling and analysis plan.

These violations were brought to your attention at the time of the inspection.

This letter serves to notify you that you are in violation of the Hazardous Waste Management Plan as mandated by L.R.S. 30:1051 et seq. Written response to this Notice of Violation shall be submitted to the Hazardous Waste Management Division within thirty (30) days of receipt of this letter. Such response shall include corrections which have been or are to be made with a time schedule therefor. Please also include steps taken to prevent any recurrence of these violations.

Failure to respond to take necessary corrective action may subject your firm to further enforcement action under L.R.S. 30:1073.

Thank you for the cooperation and courtesy extended to Ms. Karen Fisher during the inspection.

Very truly yours,

GERALD D. HEALY, JR., P.E., M.P.H.
Administrator

KDF:bjh

REFERENCE 11

~~88528~~

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALTIY
OFFICE OF SOLID & HAZARDOUS WASTE
HAZARDOUS WASTE DIVISION
GENERAL INSPECTION

DATE April 16, 1986

COMPANY Delta Shipyards (Now owned by Elevating Boats, Inc.) EPA # LAD058475419

MAILING ADDRESS Rt. 1 Box 217, Braithwaite, La. 70040

MANAGER Lynn Dean CONTACT PHONE #

OPERATION LOCATION Houma--Industrial Blvd. PARISH Terrebonne

TYPE OF OPERATION Inactive shipyard and gas free plant.

REASON FOR VISIT Sampling of impoundments and tanks. Complaint received by office stated impoundments held hazardous waste.

INVESTIGATORS Richard G. Goudeau
Vic Montelaro

PERSONS INTERVIEWED Wes Bozone
Elevating Boats

NARRATIVE:

Upon arrival at the site we were met by Mr. Bozone. He stated the site had been purchased by Mr. Lynn Dean who owned Elevating Boats, Inc. This information was not available to the inspectors prior to the effort. Subsequent to this, a purchase date of April 8, 1986 has been confirmed.

Samples were obtained from tanks and impoundments located on site. The tanks were utilized in the past in conjunction with a barge gasfreeing operation. Two closed pits also involved in this operation were sampled. Finally, samples were taken from a large open impoundment not associated with the gas free operation. (See Sketch).

Sampling went as follows:

1. Due to unforeseen presence of waste in tanks and the apparent similarity a composite was taken.

   Tanks 1, 3 and 5 only were sampled due to accessibility #20186041601 analysis requested: VOA, metals and PCB's.

2. North closed pit--20186041602--depth composite at two (2) locations. Analysis request: VOA, PCB, Metals

3. South Closed Pit--20186041603--same as 2.

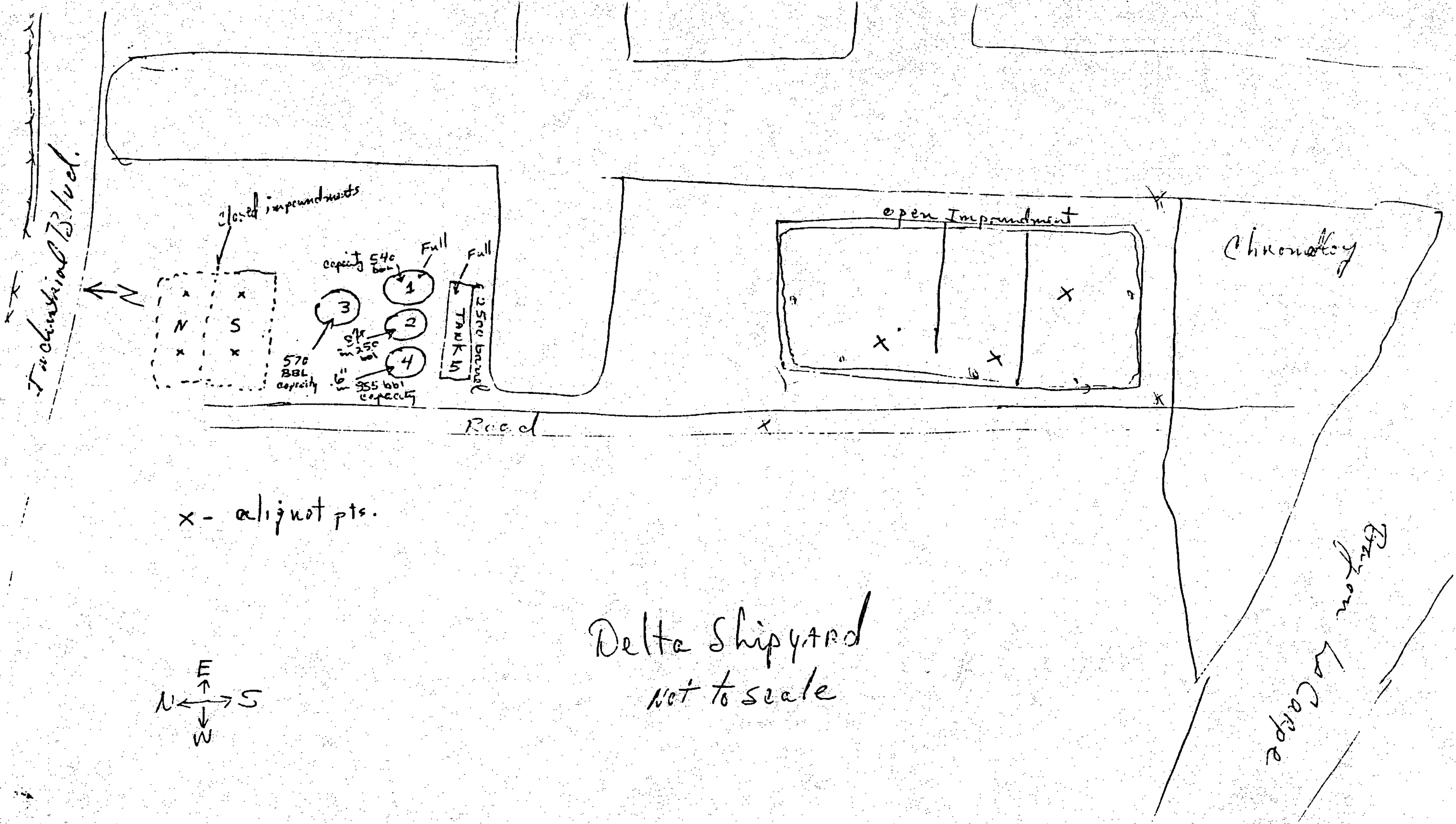
(Continued on Back)

REPORT BY: Richard Goudeau REVIEWED BY:
RICHARD GOUDEAU

DATE: May 7, 1986

THOMAS H. PATTERSON
Enforcement Program Manager

4. Open Pit--difficulty in obtaining sample.
   3 aliquots taken and composited. 20186041604
   Analysis Request: VOA, Metals, PCB's



Delta Shipyard
not to scale

REFERENCE 12

~~88529~~

SITE INSPECTION PRIORITIZATION REPORT
AND PRESCORE PACKAGE
DELTA SHIPYARD
PHASE III
HOUMA, LOUISIANA
EPA ID NO.: LAD058475419

Prepared for:

U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Contract No.: 68-W9-0015
Work Assignment: 27-6JZZ
Document Control No.: 4603-27-0229

Submitted by:

Roy F. Weston, Inc.
5599 San Felipe, Suite 700
Houston, Texas 77056
(713) 621-1620

Peter M. Rung/Robert B. Beck, P.E.

December 1994

INTRODUCTION

Roy F. Weston, Inc. (WESTON®) is pleased to present this report, which summarizes the results of the file review and PREscore package completed for the Delta Shipyard (DS) site (LAD058475419) in Houma, Terrebonne Parish, Louisiana. WESTON was tasked by the U.S. Environmental Protection Agency Region VI (EPA VI) to review existing file information and gather additional information (Phase III activities) that would more accurately determine a site score for the DS site. This effort is part of the Site Inspection Prioritization (SIP) Work Assignment for various sites in EPA VI. The PREscore package for the site is attached as part of the report.

EPA established the SIP process to help assess known or potential hazardous waste sites, address first those sites that pose the greatest threat to human health and the environment, and standardize the criteria by which sites are evaluated within the Superfund program. Through the SIP, EPA reviews sites that generally have had a complete Site Inspection (SI) performed on them but that have not received a final decision regarding the need for further investigation or remediation. The outcome of the SIP indicates whether the available information for the site meets a minimum standard of evaluation reflecting the requirements of the revised Hazard Ranking System (HRS). The SIP process better enables EPA to determine if a site is likely to receive a score of 28.5 or above under the HRS, potentially making it a candidate for placement on the National Priorities List (NPL). If it is determined that the site will not score above the NPL threshold of 28.5, EPA is in a position to declare that the site evaluation, under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), has been accomplished.

SITE BACKGROUND INFORMATION

The DS site is located in Houma, Terrebonne Parish, Louisiana. The geographic coordinates of the site are approximately latitude 29°34'2" north and longitude 90°42'18" west. A Site Location Map is provided in Attachment 1 as Figure 1, and a Site Area Map is provided in Attachment 1 as Figure 2. The site can be reached by traveling south on Highway 90 into Houma until reaching East Main Street. Travel east on Main Street for approximately 1.8 miles and turn south on Howard Avenue. From Howard Avenue, travel south for approximately 2.2 miles until reaching Industrial Boulevard. Turn east and travel 0.5 mile. The site is on the south side of Industrial Boulevard.

WESTON contacted Lynn Dean of Elevated Boats Incorporated (EBI) (8404 Colonel Drive, Shelmett, Louisiana 70043), the present owner of the site, in May 1994. Kenneth Serigne, Department Manager for the EBI property, signed an EPA Access Agreement on 15 June 1994, allowing WESTON access to the DS site. Mr. Dean was reached at (504) 278-4200. Mr. Serigne was reached at (504) 868-9655. WESTON met with Mr. Serigne during the site reconnaissance and site sampling mission.

WESTON completed the SIP site reconnaissance on 12 July 1994. The 40-acre site is part of a large industrial park covering approximately 165 acres in southeastern Houma, Louisiana. The industrial park occupies land between a boat slip and Bayou La Carpe. Bayou La Carpe provides access to the Gulf of Mexico through the Houma Intercoastal Waterway. EBI purchased 110 acres of the park in 1985 and currently leases part of it to other industries. The site is surrounded by Gemoco to the north, Christie Industries to the southeast, and Offshore Diving, Salvaging, and Blasting Company to the west. EBI maintains an active fabrication plant/office building on-site.

DS owned the site prior to EBI; the year operations began at the site is unknown. DS consisted of a barge gas-freeing operation and a cleaning and repairing facility for small cargo vessels, fishing vessels, and oil barges. The gas-freeing operation was required because the vessels had to be certified vapor free by the U.S. Coast Guard before repair work could commence. As part of the gas-freeing process, the vessels were steam-cleaned and the oily wastes were removed. The generated oils and wastewater were sent through a separation process after which the waste oil was recovered and sold. Wastes were stored in surface impoundments on-site. Two small waste pits, located approximately 100 feet east of the fabrication building, were sampled and closed in 1984 under the supervision of the Louisiana Department of Environment Quality (LDEQ) Hazardous Waste Division. Two monitoring wells are reportedly located around the closed pits; however, during the site reconnaissance, only one could be located. The pits were reportedly used to dispose of waste oil and oil field drilling material. A Site Plan Map is provided in Attachment 1 as Figure 3.

The DS site contains old gas-stripping equipment (i.e., storage tanks, separator, boiler) left behind from the former operation. The two closed waste oil surface impoundments are now a parking lot used by EBI employees. Four larger pits are located approximately 800 feet south of the fabrication building and are surrounded by dense vegetation. One pit is located west and the other three are located east of Plant Shell Road. According to a Wink Engineering sampling report in 1985, the pit west of the road is actually three pits in series that have been covered over with fill material. For the purposes of this Phase III report, these pits are considered one single pit. The three pits east of the road are exposed and covered with a crusty black substance. At the time of the site reconnaissance, rainwater containing an oily sheen was pooled on the surface of the pits.

The groundwater, soil, and surface water migration pathways are of concern at the site because of possible hazardous constituents being released to these pathways.

Previous investigations at the DS site include the following:

- A Site Inspection (SI) by Ecology & Environment, Inc. on 11 March 1981.
- A SI by The Earth Technology Corporation on 12 September 1984.
- A sampling report by Wink Engineering in July 1985.

Phase III DATA

Additional site information resulting from Phase III SIP efforts (information/data gathering/site reconnaissance/sampling mission) is described below.

Identification and Location of Groundwater Wells

WESTON used file information from EPA VI and contacted the Louisiana Department of Transportation (LDOT) for information on water wells within a 1-mile radius of the site. LDOT files indicate several monitoring wells and 1 rig supply well are located within a 1-mile radius of the site. The rig supply well is plugged and abandoned. The closest wells are three monitoring wells located 2,000 feet to the northeast of the site. They are owned by Torch Energy and are completed in the Mississippi River Alluvial Aquifer Confining Unit. They were drilled in 1990 and range from 7 to 10 feet deep. A Water Well Location Map is provided in Attachment 1 as Figure 4.

Determination of Surface Water Intakes Within the Target Distance Limit

WESTON contacted Bryan Sampey, Plant Manager at the Houma District 3 Water Plant, to determine surface water intakes within the 15-mile stream-flow Target Distance Limit (TDL). The plant is located near the confluence of the Houma Navigational Canal and Bayou Black. Mr. Sampey stated that the Houma plant takes its water from the Houma Navigational Canal. The canal is tidally influenced and saltwater intrusion is a problem. The plant uses Bayou Black as a secondary source of water when saltwater intrusion occurs in the canal. According to Mr. Sampey, the plant serves an estimated 30,000 people. The plant lies 2.55 stream miles upstream of the PPE; however, the canal is tidally influenced and therefore contaminants from the DS site could possibly migrate towards the water plant.

Identification and Location of Wetlands and Sensitive Environments

Surface water runoff draining from the site flows into Bayou La Carpe. Bayou La Carpe enters the Houma Navigational Canal just south of the site. According to the Houma, Louisiana, 7.5-minute wetlands map, the Houma Navigational Canal is bordered by extensive wetland areas. A Surface Water Pathway Map is provided in Attachment 1 as Figure 5.

Site Accessibility

Based on the WESTON Phase III site reconnaissance and sampling mission, the site is fairly accessible to the general public by both vehicle and foot. However, the site is located in an industrial park and the land has little or no recreational value.

Determination of Population by Distance Rings

During the Phase III effort, WESTON determined the population within target distances using the Geographical Exposure Modeling System (GEMS) Database. According to GEMS, 15 people live within the 0.25- to 0.5-mile radius, 3,578 people live within the 0.5- to 1-mile radius, and 36,895 live within the 1- to 4-mile radius of the site.

Identification of Fisheries

WESTON contacted Gerald Adkins of the Louisiana Department of Wildlife and Fisheries (LDWF) to determine if fisheries existed within the 15-mile TDL. Bayou La Carpe and the Houma Navigational Canal are considered limited fisheries because of problems with saltwater intrusion and marine traffic. Adkins stated that at certain times of the year, some freshwater catfish and crab fishing takes place.

Sampling Information

In general accordance with the objectives of the SIP, WESTON implemented a sampling strategy primarily aimed at documenting the presence of hazardous substances at the DS site. WESTON collected soil and sediment samples at the site on 22 August 1994. WESTON completed the sampling activities in general accordance with the site-specific Task Work Plan and Health and Safety Plan. All samples collected during the SIP were shipped to EPA-designated laboratories by Federal Express Priority Overnight Service. Samples requiring organic analyses were sent to Keystone Lab, Houston, Texas, and samples requiring inorganic analyses were sent to Silver Valley Labs, Inc., Kellog, Indiana. CLP data package excerpts are provided in Attachment 4. The sampling activities and analytical results associated with the waste source characterization are summarized in this section of the report.

WESTON collected seven sediment samples (SED-1 through SED-7) and three soil samples (SS-1 through SS-3) in an effort to document the presence and migration of hazardous substances associated with the potential hazardous waste source areas (HWSAs) at the site. Sample locations are shown in Attachment 1 as Figure 6. SIP soil/sediment sample locations, descriptions, and rationales are summarized in Attachment 3 as Table 1.

The soil and sediment samples were analyzed for the following parameters:

- Volatile organic compounds (VOCs),
- Base, neutral, and acid extractable compounds (BNAs),
- Pesticide and polychlorinated biphenyls (PCBs), and
- Inorganic constituents and cyanide.

HRS SCORING

Preliminary PAscore

Using the data provided by EPA VI from Resource Conservation and Recovery Act (RCRA) and CERCLA files, WESTON developed a preliminary HRS score for the site using PAscore

(Version 2.0). The site received a PAscore of significant value to warrant evaluation of the site using PREscore. PREscore was used to develop and document the HRS score for the site in more detail.

PREscore

Factors that had the greatest influence on the Phase III PREscore evaluation are identified in the following sections. Conclusions concerning the site HRS score are presented following the discussion of factors affecting the PREscore. The Phase III PREscore package for the site is provided as Attachment 2.

WASTE SOURCE CHARACTERISTICS

The laboratory analytical results for soil samples SS-2 and SS-3 and sediment samples SED-1, SED-2, and SED-3 were collected from the pits during the SIP and can be used to characterize the potential HWSAs.

Four waste source areas were identified in the file review and site reconnaissance. They consist of four pits used to store waste oils from the DS ship cleaning and repair operation. Pit 4 is actually three pits according to a Wink Engineering report; however, the pits are aligned in series, covered over, and vegetated. For purposes of the Phase III report, they are designated together as Pit 4. The other three pits (1, 2, and 3) are exposed and covered by a black crusty substance. Pits 1, 2, and 3 are elevated and surrounded by a 3- to 6-foot berm. The four pits together have an approximated surface area of 294,000 square feet. The waste characteristics of the site were assessed for the groundwater, soil, and surface water exposure pathways.

Samples collected from the pits indicate the presence of volatiles, semivolatile organics, pesticides, and metals. Sediment analytical results reported at concentrations exceeding three times background concentrations are summarized in Attachment 3, Tables 2 and 3. Soil analytical results reported at concentrations three times background concentrations are summarized in Attachment 3, Table 4. The CLP data summary package is provided as Attachment 4 and photodocumentation is provided as Attachment 5.

Groundwater Pathway

WESTON did not collect any groundwater samples as part of this effort. As part of the monitoring well installation in 1984, soil borings were drilled at the site. The borings indicated low permeability silty clays to 50 feet below grade. No groundwater uses, domestic or industrial, were documented within a 1-mile radius of the site. The factors that most influenced the groundwater pathway Phase III score are as follows:

- LDOT information stating that there is no groundwater use within 1 mile of the site.

- The lack of analytical data to determine a release of hazardous wastes to groundwater in the vicinity of the site.

- The low permeability of the clay soils at the site.

Surface Water Pathway

The laboratory analytical results for sediment samples SED-4 through SED-7 collected during the SIP can be used to characterize the potential for contaminant migration in the surface water pathway. A drainage ditch runs along the west and south ends of Pits 1 through 3. An overflow pipe on Pit 2 drains rainwater from the pit into the ditch. Surface water draining from the pits follows the ditch approximately 0.3 mile until reaching the probable point of entry (PPE) at Bayou La Carpe. Bayou La Carpe flows approximately 4,000 feet south until reaching the Houma Navigational Canal. The Houma Navigational Canal is tidally influenced. Due to the tidal influence, two TDLs are assigned to the site, TDL-1 and TDL-2. TDL-1 is located approximately 2.55 miles upstream of the PPE at the water plant, the farthest point where saltwater intrusion has been documented. TDL-2 is located 15 miles downstream in the Houma Navigational Canal.

The Houma Water Plant is located at the confluence of Bayou Black and the Houma Navigational Canal, approximately 2.55 miles upstream of the site. Bryan Sampey, plant manager of the Houma Water Plant, stated that when saltwater intrusion becomes a problem at the surface water intake, the plant switches to Bayou Black for a water supply. The saltwater encroachment is typically seasonal. The plant reportedly serves 30,000 residents in the surrounding area. According to Gerald Adkins of LDWF, Bayou La Carpe and the Houma Navigational Canal are considered limited fisheries because of saltwater intrusion and marine traffic.

Sediment samples collected from the drainage ditch surrounding Pits 1 through 3 indicate the presence of several semivolatile organics and metals. Sediment analytical results reported at concentrations exceeding three times background concentrations are summarized in Attachment 3, Tables 2 and 3. A Surface Water Pathway Map is provided in Attachment 1 as Figure 5.

Soil Exposure Pathway

The site is situated near a residential area and is accessible to the public; however, there are no residences within 200 feet of on-site contamination. The site serves as an industrial park and has little or no recreational value. EBI maintains 20 workers on-site. The residents of Houma living within 1 mile of the site were scored as nearby individuals. The most important factors considered for the soil exposure pathway are as follows:

- The pits are accessible and there is a residential population within the nearby vicinity. However, no recreational activities were documented on-site.

- Several on-site workers are present in the industrial park.

Air Pathway

The air pathway was not evaluated as part of the Phase III effort due to lack of data; however, during the SIP quantitative air monitoring, no readings were measured at levels above background concentrations in the breathing space around the pits. Readings taken near the surface of the pits did exceed background concentrations.

Data Gaps

WESTON identified several data gaps during the file review and PREscore evaluation. Some of these data gaps were filled (as directed by EPA VI) during Phase III data collection; however, additional data gaps remain and may significantly affect the site score. The most critical remaining data gaps include the following:

- Additional analytical data to indicate if hazardous materials present at the site are releasing to Bayou La Carpe and the Houma Navigational Canal.

- Additional analytical data to determine if hazardous materials are affecting the Houma Water Plant.

- Additional investigation of the sensitive environments associated with the surface water pathway and an accurate delineation of the upstream TDL.

CONCLUSIONS

The DS site is an inactive barge cleaning, repairing, and gas-freeing operation located on the southern side of Houma, in Terrebonne Parish, Louisiana. The DS site operated as a barge cleaning, repairing, and gas-freeing facility for an undetermined period of time prior to 1986 when EBI bought the site.

Concerns associated with the migration of hazardous constituents from the site and exposure pathways are summarized as follows:

- Based on the information presented in the Groundwater Pathway section, a release of hazardous constituents to groundwater is of little concern. A release to groundwater has not been documented, the subsurface soils are relatively impermeable, and no groundwater use has been identified in the vicinity of the site.

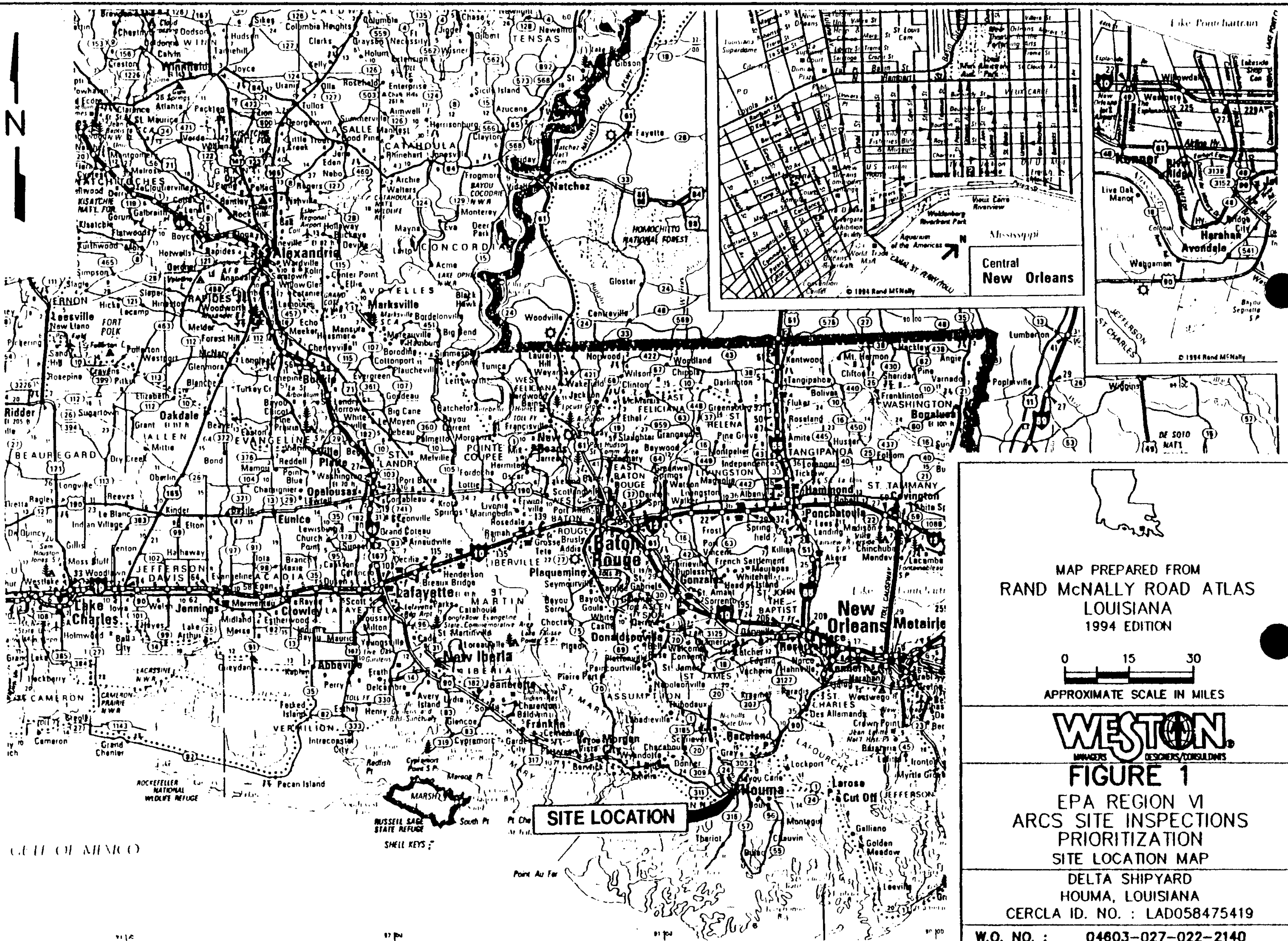
- Based on the information presented in the Surface Water Pathway section, a release of hazardous constituents to surface water is of concern. Several hazardous constituents were detected in the drainage ditch leading to Bayou La Carpe. The Houma Water Plant surface water intake and several miles of wetlands frontage are located within the TDL.

- Based on the information presented in the Soil Exposure Pathway section, a release of hazardous constituents is of concern because several semivolatile organics, pesticides, and heavy metals have been detected in the on-site pits at levels significantly above background concentrations. Soil exposure targets include the on-site workers and the nearby population.

- Based on the information presented in the Air Pathway section, the air pathway is of no concern because the barge cleaning, repairing, and gas-freeing facility is no longer active.

The individual pathways with the greatest influence on the HRS score were surface water and soil exposure pathways.

ATTACHMENT 1



MAP PREPARED FROM
RAND McNALLY ROAD ATLAS
LOUISIANA
1994 EDITION

0 15 30
APPROXIMATE SCALE IN MILES

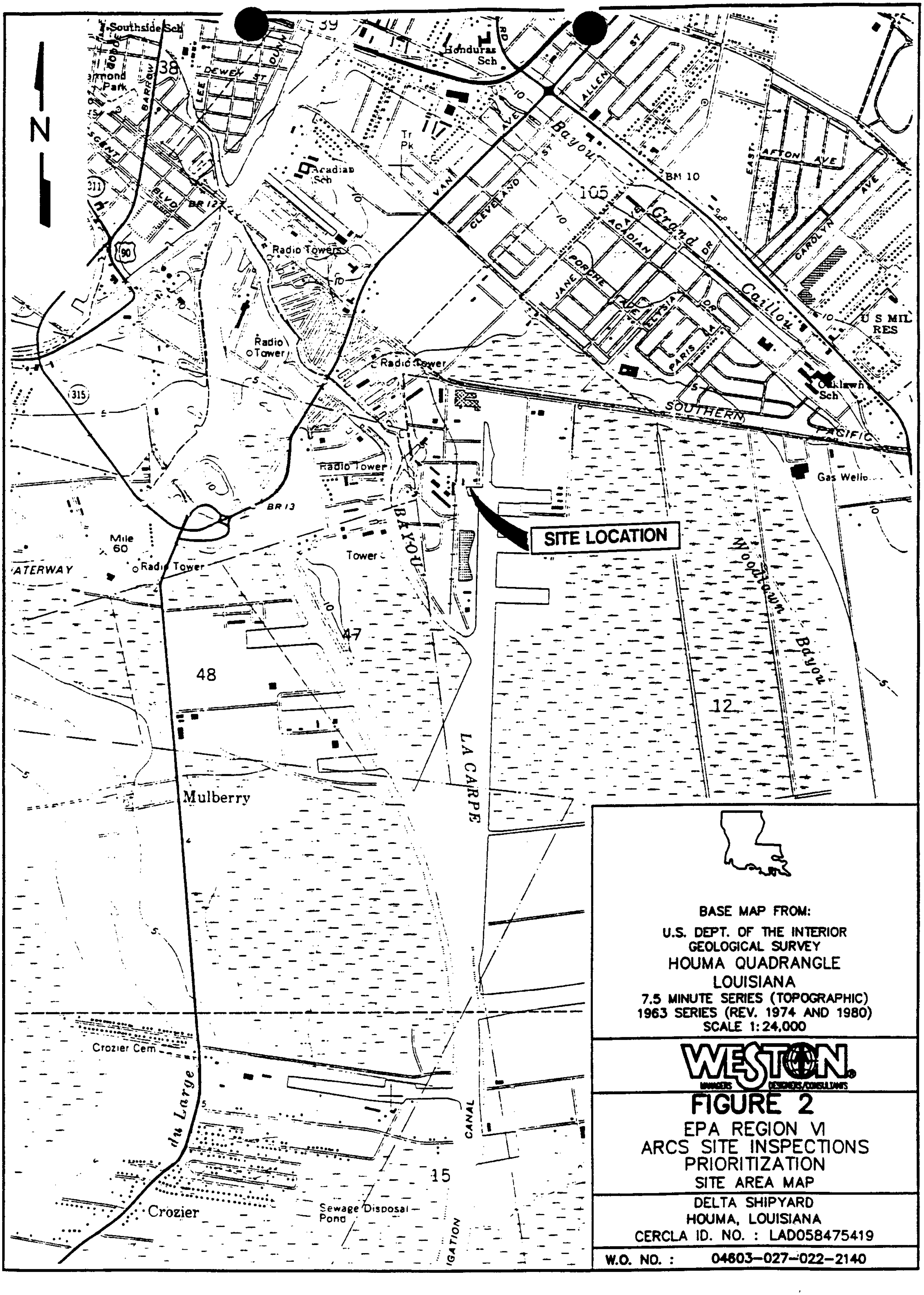
WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1

EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
SITE LOCATION MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-027-022-2140



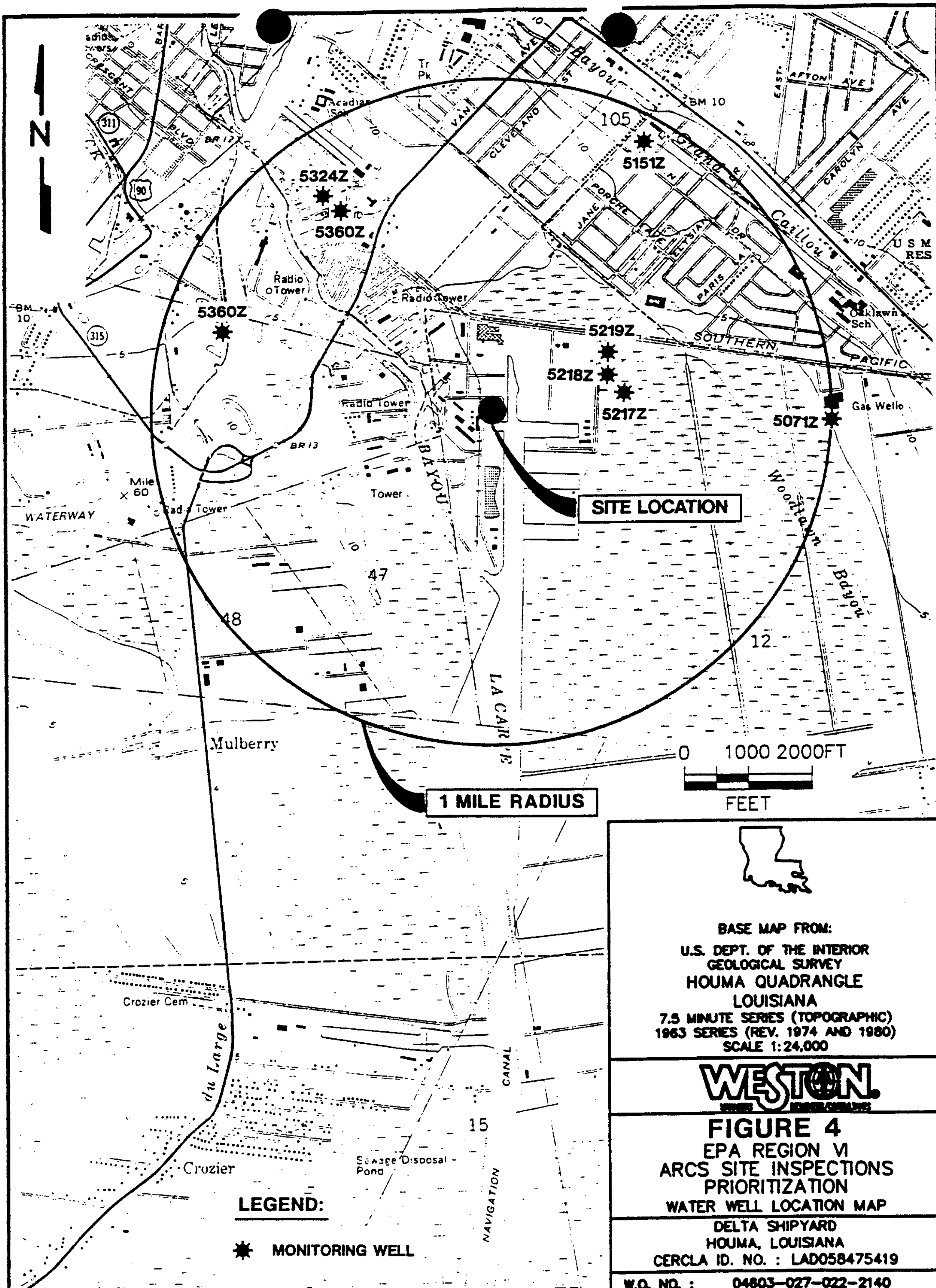
BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
HOUMA QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1963 SERIES (REV. 1974 AND 1980)
SCALE 1:24,000

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2
EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
SITE AREA MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-027-022-2140



BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
HOUMA QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1963 SERIES (REV. 1974 AND 1980)
SCALE 1:24,000

WESTON

FIGURE 4
EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
WATER WELL LOCATION MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04803-027-022-2140

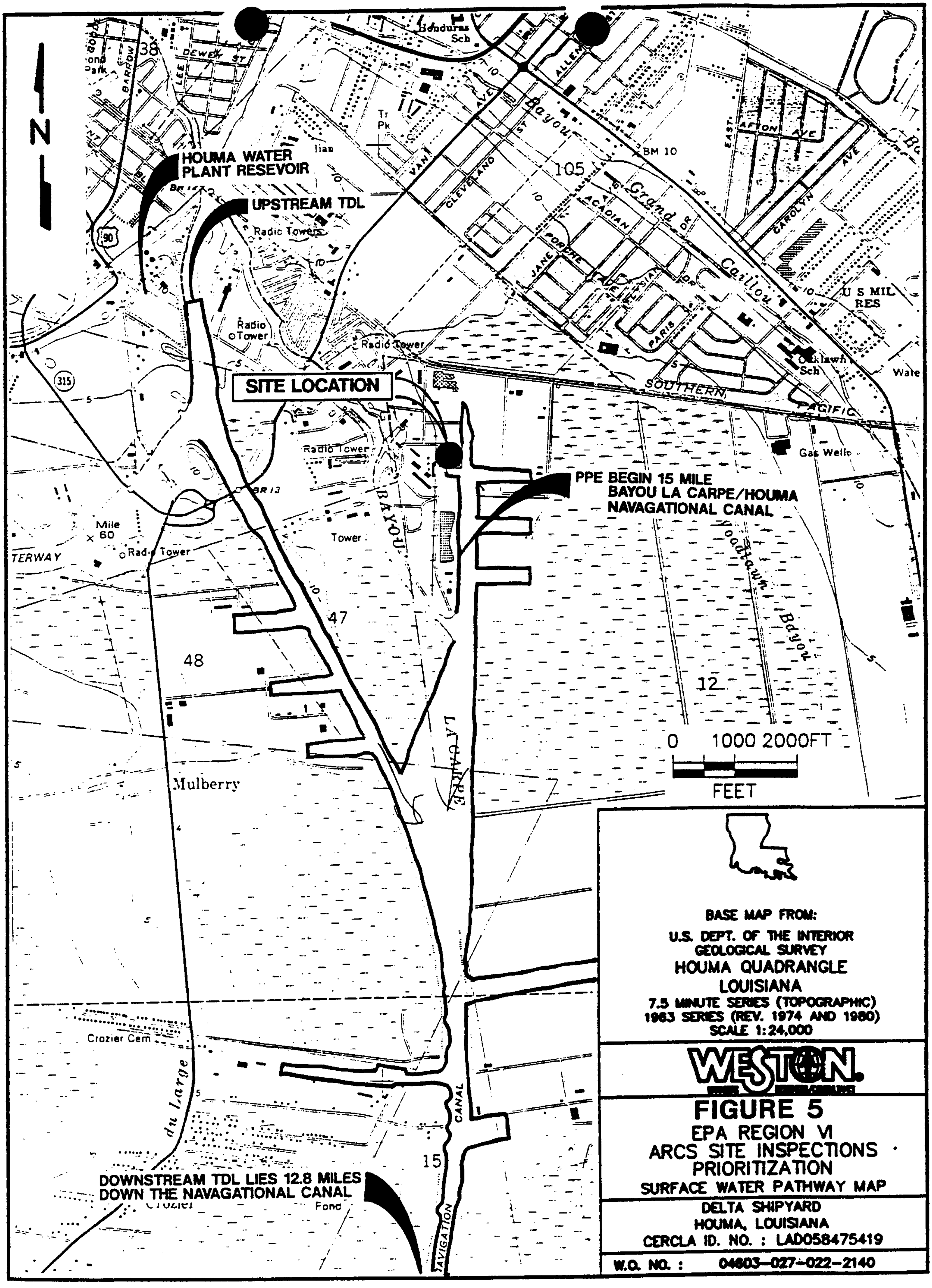
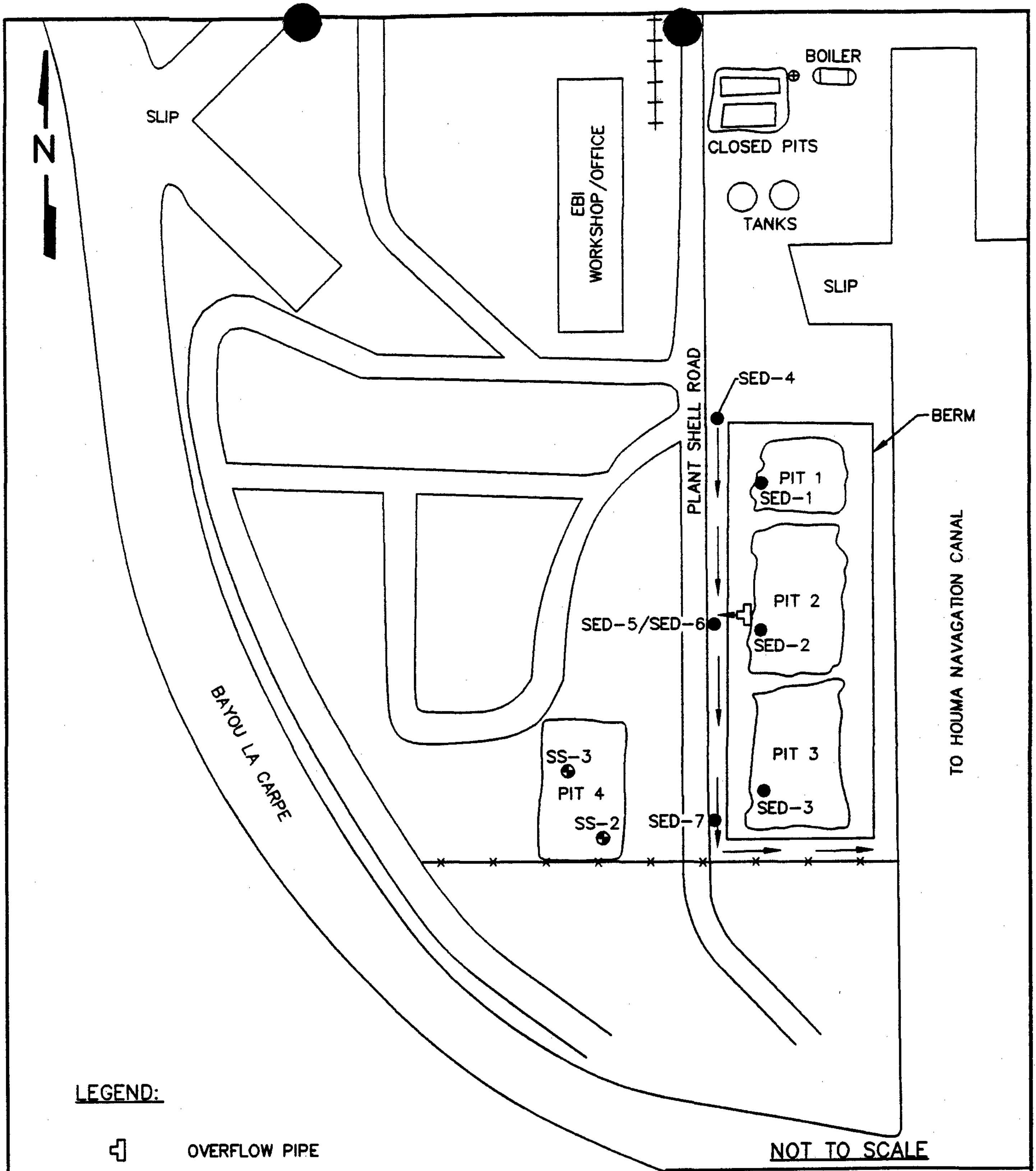


FIGURE 5

EPA REGION VI
ARCS SITE INSPECTIONS PRIORITIZATION
SURFACE WATER PATHWAY MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-027-022-2140



NOT TO SCALE

LEGEND:

- OVERFLOW PIPE
- FENCE
- DRAINAGE DITCH
- SEDIMENT SAMPLE
- SOIL SAMPLE

NOTE

SS-1 IS TAKEN OFFSITE AS A BACKGROUND SAMPLE.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 6

EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
SAMPLE LOCATION MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-027-022-2140

I: \ARCS\ARC2722\2140.PA.RF 11-28-94 1=1

PCP=I: \ARCS\ARC2722\ARCS

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
1,1,1-Trichloroethane	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
1,1,2,2-Tetrachloroethane	ND	-----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
1,1,2-Trichloroethane	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
1,1-Dichloroethane	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,1-Dichloroethene	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,2-Dichloroethane	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,2-Dichloroethene (total)	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,2-Dichloropropane	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
2-Butanone	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
2-Hexanone	ND	-----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
4-Methyl-2-pentanone	ND	-----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
Acetone	ND	-----	13 UJ	160 UJ	21 U	21 U	18 U	18 UJ
Benzene	ND	-----	13 UJ	73	21 UJ	21 U	18 UJ	18 UJ
Bromodichloromethane	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Bromoform	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Bromomethane	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Carbon disulfide	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Carbon tetrachloride	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Chlorobenzene	ND	-----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
Chloroethane	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Chloroform	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Chloromethane	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
cis-1,3-Dichloropropene	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Dibromochloromethane	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Ethylbenzene	ND	-----	13 UJ	170	21 UJ	21 UJ	18 UJ	18 UJ
Methylene Chloride	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Styrene	ND	-----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
Tetrachloroethene	ND	-----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Toluene	5	15	13 UJ	43 J C-BSQL	21 UJ	5 Jv	18 UJ	18 UJ
trans-1,3-Dichloropropene	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Trichloroethene	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Vinyl Chloride	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Xylenes (total)	ND	-----	13 UJ	240	21 UJ	21 UJ	18 UJ	18 UJ

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
1,2,4-Trichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
1,2-Dichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
1,3-Dichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
1,4-Dichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,2'-Oxybis(1-chloropropane)	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4,5-Trichlorophenol	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
2,4,6-Trichlorophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4-Dichlorophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4-Dimethylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4-Dinitrophenol	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
2-Chloronaphthalene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2-Chlorophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2-Methylnaphthalene	69	207	430 U	47000	700 U	690 U	580 U	580 U
2-Methylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2-Nitroaniline	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
2-Nitrophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
3,3'-Dichlorobenzidine	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
3-Nitroaniline	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
4,6-Dinitro-2-methylphenol	ND	-----	1000 UR	11000 U	1700 U	1700 U	1400 U	1400 U
4-Bromophenyl-phenylether	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
4-Chloro-3-methylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Chloroaniline	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Chlorophenyl-phenylether	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Methylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Nitroaniline	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
4-Nitrophenol	ND	-----	1000 UR	11000 U	1700 U	1700 U	1400 U	1400 U
Acenaphthene	ND	-----	430 U	1800 J C-BSQL	700 U	470 J C-BSQL	580 U	34 J C-BSQL
Acenaphthylene	ND	-----	430 U	550 J C-BSQL	700 U	89 J C-BSQL	60 J C-BSQL	46 J C-BSQL

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Anthracene	ND	-----	430 UR	540 J C-BSQL	700 U	1300 J	83 J C-BSQL	82 J C-BSQL
Benzo(a)anthracene	ND	-----	430 UJ	440 J C-BSQL	700 U	6000 J	580 J	310 J C-BSQL
Benzo(a)pyrene	ND	-----	430 UJ	210 J C-BSQL	700 U	4100 J	390 J C-BSQL	190 J C-BSQL
Benzo(b)fluoranthene	ND	-----	300 Jv	450 J C-BSQL	700 U	6100 J	840 J	410 J C-B
Benzo(g,h,i)perylene	ND	-----	430 UJ	4500 U	700 U	2500 J	430 J C-BSQL	290 J C-BSQL
Benzo(k)fluoranthene	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
bis(2-Chloroethoxy)methane	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
bis(2-Chloroethyl)ether	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
bis(2-Ethylhexyl)phthalate	ND	-----	430 UJ	4500 U	700 U	190 J C-BSQL	120 J C-BSQL	580 U
Butylbenzylphthalate	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
Carbazole	ND	-----	430 UR	4500 U	700 U	690	580 U	87 J C-BSQL
Chrysene	ND	-----	1200 Jv	460 J C-BSQL	700 U	5300 J	710 J	270 J C-BSQL
Di-n-butylphthalate	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
Di-n-octylphthalate	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
Dibenz(a,h)anthracene	ND	-----	430 UJ	4500 U	700 U	1300 J	180 J C-BSQL	580 U
Dibenzofuran	ND	-----	430 U	1300 J C-BSQL	700 U	120 J C-BSQL	580 U	580 U
Diethylphthalate	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Dimethylphthalate	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Fluoranthene	ND	-----	430 UR	4500 U	700 U	13000 J	1000 J	530 J C-BSQL
Fluorene	ND	-----	430 U	5100	700 U	310 J C-BSQL	580 U	40 J C-BSQL
Hexachlorobenzene	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
Hexachlorobutadiene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Hexachlorocyclopentadiene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Hexachloroethane	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Indeno(1,2,3-cd)pyrene	ND	-----	430 UJ	4500 U	700 U	3000 J	390 J C-BSQL	210 J C-BSQL
Isophorone	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
N-Nitroso-di-n-propylamine	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
N-Nitrosodiphenylamine	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Naphthalene	ND	-----	430 U	11000	700 U	690 U	580 U	580 U
Nitrobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Pentachlorophenol	ND	-----	1000 UR	11000 U	1700 U	1700 U	1400 U	1400 U
Phenanthrene	ND	-----	430 UR	8800	700 U	5000 J	310 J C-BSQL	440 J C-BS
Phenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Pyrene	ND	-----	430 UJ	740 J C-BSQL	700 U	12000 J	570 J C-BSQL	390 J C-BSQL

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
4,4'-DDD	ND	-----	35	4.5 U	7 U	6.9 U	5.8 U	5.8 U
4,4'-DDE	ND	-----	4.3 U	4.5 U	7 UJ	6.9 U	5.8 U	5.8 U
4,4'-DDT	ND	-----	4.3 UR	4.5 U	7 U	6.9 U	5.8 U	5.8 U
Aldrin	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	3 U	3 U
alpha-BHC	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	3 U	3 U
alpha-Chlordane	ND	-----	2.2 U	4.5 U	3.6 UJ	3.5 U	3 U	0.32 J C-BSQL
beta-BHC	7.4	22.2	12 JT	2.3 U	1.1 Jv	3.5 U	3 U	3 U
delta-BHC	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	0.26 J C-BSQL	3 U
Dieldrin	ND	-----	4.3 U	4.5 U	7 UJ	6.9 U	5.8 U	5.8 U
Endosulfan I	ND	-----	2.2 U	2.3 U	3.6 U	3.5 U	3 U	3 U
Endosulfan II	ND	-----	4.3 U	4.5 U	7 U	6.9 U	5.8 U	5.8 U
Endosulfan sulfate	ND	-----	4.3 U	4.5 U	7 U	6.9 U	5.8 U	5.8 U
Endrin	ND	-----	4.3 U	4.5 U	7 UJ	6.9 U	5.8 U	5.8 U
Endrin aldehyde	ND	-----	4.3 U	13 JT C-NA	7 U	6.9 U	5.8 U	5.8 U
Endrin ketone	ND	-----	7.1 JT C-NA	1 J C-BSQL	7 U	6.9 U	5.8 U	5.8 U
gamma-BHC (lindane)	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	3 U	3 U
gamma-Chlordane	1.1	3.3	2.2 U	9.8 JT C-NA	3.6 UJ	0.39 J	0.26 J	0.26 J
Heptachlor	ND	-----	2.2 U	1.5 J C-BSQL	0.17 Jv C-BSQL	3.5 U	3 U	3 U
Heptachlor epoxide	1.3	3.9	25 J C-UB	3.7 J	2.3 Jv	3.5 U	3 U	3 U
Methoxychlor	ND	-----	69 J	23 U	3.7 J C-BSQL	35 U	30 U	30 U
Toxaphene	ND	-----	220 UJ	230 U	360 U	350 U	300 U	300 U

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Aroclor-1016	ND	-----	43 U	45 U	70 U	69 U	58 U	58 U
Aroclor-1221	ND	-----	88 U	92 UJ	140 U	140 U	120 U	120 U
Aroclor-1232	ND	-----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1242	ND	-----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1248	ND	-----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1254	ND	-----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1260	ND	-----	43 UJ	45 U	70 U	69 U	58 U	58 U

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 MFDP04 08/22/94	SED002 SED002 MFDP05 08/22/94	SED003 SED003 MFDP06 08/22/94	SED005 SED005 MFDP08 08/22/94	SED005 SED006 MFDP09 08/22/94	SED007 SED007 MFDP10 08/22/94
ALUMINUM	3400	10200	6430	6830	6160	9090	6890	10900
ANTIMONY	ND	-----	10.5 J	7.5 J	9.7 UJ	10.9 UJ	12.5 J	12 UJ
ARSENIC	4.9	14.7	22.1 Jv	6.3 Jv	4.2 Jv	24.8 Jv	16.3 Jv	23.1 Jv
BARIUM	5540	16620	11900	15100	18000	20100	17300	20500
BERYLLIUM	0.29	0.87	0.53	0.49	0.39	0.79	0.75	0.94
CADMIUM	ND	-----	4.9	1 U	1.8	1.5 U	1.7	1.6 U
CALCIUM	86100	258300	12000	4030	4810	9420	14200	16400
CHROMIUM	58.3	174.9	527	54.4	35.2	27.8	39.1	42.8
COBALT	5	15	9.7	11.4	8.8 Jv	13.5	10.5 Jv	16.8 C-NA
COPPER	66.8	200.4	75.2 J	48.4 J	33.6 J	61.3 J	55.2 J	45.8 J
CYANIDE	ND	-----	0.67 U	0.65 U	0.85 U	0.95 U	0.88 U	1.1 U
IRON	23200	69600	21500	43200	10200	19800	16400	21400
LEAD	92	276	632	185	158	181	195	125
MAGNESIUM	5300	15900	2850	2100	2470	3740	3270	4610
MANGANESE	245	735	480	231	120	280	305	509
MERCURY	ND	-----	1.3 J	0.22 J	0.23 J	0.29 J	0.3 J	0.21 UJ
NICKEL	9.4	28.2	18.9	25.2	12.9	24.4	19.4	28.4 C-NA
POTASSIUM	703	2109	1570	1270	1140	1760	1420	1610
SELENIUM	ND	-----	0.37	0.18 U	0.31	0.27 U	0.25 U	0.29 U
SILVER	1.4	4.2	4.1	3.3	1.3	2.2	3.5	3.3
SODIUM	241	723	331	180	181	289	253	360
THALLIUM	0.5	1.5	0.61	0.4	0.41	0.76	0.47	0.62
VANADIUM	9	27	24.4	18.7	14.9	25.4	19.5	30.1
ZINC	805	2415	835	302	149	449	444	245

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
2,4-Dinitrotoluene	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
2,6-Dinitrotoluene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,1,1-Trichloroethane	ND	-----	15	UJ					
1,1,2,2-Tetrachloroethane	ND	-----	15	UJ					
1,1,2-Trichloroethane	ND	-----	15	UJ					
1,1-Dichloroethane	ND	-----	15	UJ					
1,1-Dichloroethene	ND	-----	15	UJ					
1,2-Dichloroethane	ND	-----	15	UJ					
1,2-Dichloroethene (total)	ND	-----	15	UJ					
1,2-Dichloropropane	ND	-----	15	UJ					
2-Butanone	ND	-----	15	UJ					
2-Hexanone	ND	-----	15	UJ					
4-Methyl-2-pentanone	ND	-----	15	UJ					
Acetone	ND	-----	15	UJ					
Benzene	ND	-----	15	UJ					
Bromodichloromethane	ND	-----	15	UJ					
Bromoform	ND	-----	15	UJ					
Bromomethane	ND	-----	15	UJ					
Carbon disulfide	ND	-----	15	UJ					
Carbon tetrachloride	ND	-----	15	UJ					
Chlorobenzene	ND	-----	15	UJ					
Chloroethane	ND	-----	15	UJ					
Chloroform	ND	-----	15	UJ					
Chloromethane	ND	-----	15	UJ					
cis-1,3-Dichloropropene	ND	-----	15	UJ					
Dibromochloromethane	ND	-----	15	UJ					
Ethylbenzene	ND	-----	15	UJ					
Methylene Chloride	ND	-----	15	UJ					
Styrene	ND	-----	15	UJ					
Tetrachloroethene	ND	-----	15	UJ					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Toluene	5	15	5 Jv					
trans-1,3-Dichloropropene	ND	-----	15 UJ					
Trichloroethene	ND	-----	15 UJ					
Vinyl Chloride	ND	-----	15 UJ					
Xylenes (total)	ND	-----	15 UJ					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
4,4'-DDD	ND	-----	5.1	U					
4,4'-DDE	ND	-----	5.1	U					
4,4'-DDT	ND	-----	5.1	U					
Aldrin	ND	-----	2.6	U					
alpha-BHC	ND	-----	2.6	U					
alpha-Chlordane	ND	-----	2.6	U					
beta-BHC	7.4	22.2	7.4	T					
delta-BHC	ND	-----	2.6	U					
Dieldrin	ND	-----	5.1	U					
Endosulfan I	ND	-----	2.6	U					
Endosulfan II	ND	-----	5.1	U					
Endosulfan sulfate	ND	-----	5.1	U					
Endrin	ND	-----	5.1	U					
Endrin aldehyde	ND	-----	5.1	U					
Endrin ketone	ND	-----	5.1	U					
gamma-BHC (lindane)	ND	-----	2.6	U					
gamma-Chlordane	1.1	3.3	1.1	J					
Heptachlor	ND	-----	2.6	U					
Heptachlor epoxide	1.3	3.9	1.3	J					
Methoxychlor	ND	-----	26	U					
Toxaphene	ND	-----	260	U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Aroclor-1016	ND	-----	51 U					
Aroclor-1221	ND	-----	100 U					
Aroclor-1232	ND	-----	51 U					
Aroclor-1242	ND	-----	51 U					
Aroclor-1248	ND	-----	51 U					
Aroclor-1254	ND	-----	51 U					
Aroclor-1260	ND	-----	51 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,2,4-Trichlorobenzene	ND	-----	510	U					
1,2-Dichlorobenzene	ND	-----	510	U					
1,3-Dichlorobenzene	ND	-----	510	U					
1,4-Dichlorobenzene	ND	-----	510	U					
2,2'-Oxybis(1-chloropropane)	ND	-----	510	U					
2,4,5-Trichlorophenol	ND	-----	1200	U					
2,4,6-Trichlorophenol	ND	-----	510	U					
2,4-Dichlorophenol	ND	-----	510	U					
2,4-Dimethylphenol	ND	-----	510	U					
2,4-Dinitrophenol	ND	-----	1200	U					
2-Chloronaphthalene	ND	-----	510	U					
2-Chlorophenol	ND	-----	510	U					
2-Methylnaphthalene	69	207	69	J					
2-Methylphenol	ND	-----	510	U					
2-Nitroaniline	ND	-----	1200	U					
2-Nitrophenol	ND	-----	510	U					
3,3'-Dichlorobenzidine	ND	-----	510	UJ					
3-Nitroaniline	ND	-----	1200	U					
4,6-Dinitro-2-methylphenol	ND	-----	1200	U					
4-Bromophenyl-phenylether	ND	-----	510	U					
4-Chloro-3-methylphenol	ND	-----	510	U					
4-Chloroaniline	ND	-----	510	U					
4-Chlorophenyl-phenylether	ND	-----	510	U					
4-Methylphenol	ND	-----	510	U					
4-Nitroaniline	ND	-----	1200	U					
4-Nitrophenol	ND	-----	1200	U					
Acenaphthene	ND	-----	510	U					
Acenaphthylene	ND	-----	510	U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Anthracene	ND	-----	510 U					
Benzo(a)anthracene	ND	-----	510 UJ					
Benzo(a)pyrene	ND	-----	510 UJ					
Benzo(b)fluoranthene	ND	-----	510 UJ					
Benzo(g,h,i)perylene	ND	-----	510 UJ					
Benzo(k)fluoranthene	ND	-----	510 UJ					
bis(2-Chloroethoxy)methane	ND	-----	510 U					
bis(2-Chloroethyl)ether	ND	-----	510 U					
bis(2-Ethylhexyl)phthalate	ND	-----	510 UJ					
Butylbenzylphthalate	ND	-----	510 UJ					
Carbazole	ND	-----	510 U					
Chrysene	ND	-----	510 UJ					
Di-n-butylphthalate	ND	-----	510 U					
Di-n-octylphthalate	ND	-----	510 UJ					
Dibenz(a,h)anthracene	ND	-----	510 UJ					
Dibenzofuran	ND	-----	510 U					
Diethylphthalate	ND	-----	510 U					
Dimethylphthalate	ND	-----	510 U					
Fluoranthene	ND	-----	510 U					
Fluorene	ND	-----	510 U					
Hexachlorobenzene	ND	-----	510 U					
Hexachlorobutadiene	ND	-----	510 U					
Hexachlorocyclopentadiene	ND	-----	510 U					
Hexachloroethane	ND	-----	510 U					
Indeno(1,2,3-cd)pyrene	ND	-----	510 UJ					
Isophorone	ND	-----	510 U					
N-Nitroso-di-n-propylamine	ND	-----	510 U					
N-Nitrosodiphenylamine	ND	-----	510 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Naphthalene	ND	-----	510 U					
Nitrobenzene	ND	-----	510 U					
Pentachlorophenol	ND	-----	1200 U					
Phenanthrene	ND	-----	510 U					
Phenol	ND	-----	510 U					
Pyrene	ND	-----	510 UJ					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 MFDP07 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
ALUMINUM	3400	10200	3400					
ANTIMONY	ND	-----	7.6 UJ					
ARSENIC	4.9	14.7	4.9 Jv					
BARIUM	5540	16620	5540					
BERYLLIUM	0.29	0.87	0.29					
CADMIUM	ND	-----	1 U					
CALCIUM	86100	258300	86100					
CHROMIUM	58.3	174.9	58.3					
COBALT	5	15	5 Jv					
COPPER	66.8	200.4	66.8 J					
CYANIDE	ND	-----	0.67 U					
IRON	23200	69600	23200					
LEAD	92	276	92					
MAGNESIUM	5300	15900	5300					
MANGANESE	245	735	245					
MERCURY	ND	-----	0.13 UJ					
NICKEL	9.4	28.2	9.4					
POTASSIUM	703	2109	703					
SELENIUM	ND	-----	0.19 UJ					
SILVER	1.4	4.2	1.4					
SODIUM	241	723	241					
THALLIUM	0.5	1.5	0.5 J					
VANADIUM	9	27	9					
ZINC	805	2415	805					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
2,4-Dinitrotoluene	ND	-----	510 U					
2,6-Dinitrotoluene	ND	-----	510 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,1,1-Trichloroethane	ND	-----	13 UJ	14 U				
1,1,2,2-Tetrachloroethane	ND	-----	13 UJ	14 U				
1,1,2-Trichloroethane	ND	-----	13 UJ	14 U				
1,1-Dichloroethane	ND	-----	13 UJ	14 U				
1,1-Dichloroethene	ND	-----	13 UJ	14 U				
1,2-Dichloroethane	ND	-----	13 UJ	14 U				
1,2-Dichloroethene (total)	ND	-----	13 UJ	14 U				
1,2-Dichloropropane	ND	-----	13 UJ	14 U				
2-Butanone	ND	-----	13 UJ	14 U				
2-Hexanone	ND	-----	13 UJ	14 U				
4-Methyl-2-pentanone	ND	-----	13 UJ	14 U				
Acetone	ND	-----	13 UJ	40 U				
Benzene	ND	-----	13 UJ	14 U				
Bromodichloromethane	ND	-----	13 UJ	14 U				
Bromoform	ND	-----	13 UJ	14 U				
Bromomethane	ND	-----	13 UJ	14 U				
Carbon disulfide	ND	-----	13 UJ	14 U				
Carbon tetrachloride	ND	-----	13 UJ	14 U				
Chlorobenzene	ND	-----	13 UJ	14 U				
Chloroethane	ND	-----	13 UJ	14 U				
Chloroform	ND	-----	13 UJ	14 U				
Chloromethane	ND	-----	13 UJ	14 U				
cis-1,3-Dichloropropene	ND	-----	13 UJ	14 U				
Dibromochloromethane	ND	-----	13 UJ	14 U				
Ethylbenzene	ND	-----	13 UJ	14 U				
Methylene Chloride	ND	-----	13 UJ	14 U				
Styrene	ND	-----	13 UJ	14 U				
Tetrachloroethene	ND	-----	13 UJ	14 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Toluene	ND	-----	13 UJ	14 U				
trans-1,3-Dichloropropene	ND	-----	13 UJ	14 U				
Trichloroethene	ND	-----	13 UJ	14 U				
Vinyl Chloride	ND	-----	13 UJ	14 U				
Xylenes (total)	ND	-----	13 UJ	14 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,2,4-Trichlorobenzene	ND	-----	440 U	470 U				
1,2-Dichlorobenzene	ND	-----	440 U	470 U				
1,3-Dichlorobenzene	ND	-----	440 U	470 U				
1,4-Dichlorobenzene	ND	-----	440 U	470 U				
2,2'-Oxybis(1-chloropropane)	ND	-----	440 U	470 U				
2,4,5-Trichlorophenol	ND	-----	1100 U	1100 U				
2,4,6-Trichlorophenol	ND	-----	440 U	470 U				
2,4-Dichlorophenol	ND	-----	440 U	470 U				
2,4-Dimethylphenol	ND	-----	440 U	470 U				
2,4-Dinitrophenol	ND	-----	1100 U	1100 U				
2-Chloronaphthalene	ND	-----	440 U	470 U				
2-Chlorophenol	ND	-----	440 U	470 U				
2-Methylnaphthalene	ND	-----	440 U	250 J C-BSQL				
2-Methylphenol	ND	-----	440 U	470 U				
2-Nitroaniline	ND	-----	1100 U	1100 U				
2-Nitrophenol	ND	-----	440 U	470 U				
3,3'-Dichlorobenzidine	ND	-----	440 U	470 U				
3-Nitroaniline	ND	-----	1100 U	1100 U				
4,6-Dinitro-2-methylphenol	ND	-----	1100 U	1100 U				
4-Bromophenyl-phenylether	ND	-----	440 U	470 U				
4-Chloro-3-methylphenol	ND	-----	440 U	470 U				
4-Chloroaniline	ND	-----	440 U	470 U				
4-Chlorophenyl-phenylether	ND	-----	440 U	470 U				
4-Methylphenol	ND	-----	440 U	470 U				
4-Nitroaniline	ND	-----	1100 U	1100 U				
4-Nitrophenol	ND	-----	1100 U	1100 U				
Acenaphthene	ND	-----	440 U	470 U				
Acenaphthylene	ND	-----	440 U	470 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Anthracene	ND	-----	51 J C-BSQL	470 U				
Benzo(a)anthracene	33	99	100 J C-BSQL	95 J				
Benzo(a)pyrene	ND	-----	86 J C-BSQL	470 U				
Benzo(b)fluoranthene	53	159	130 J	85 J				
Benzo(g,h,i)perylene	ND	-----	100 J C-BSQL	470 U				
Benzo(k)fluoranthene	ND	-----	440 U	470 U				
bis(2-Chloroethoxy)methane	ND	-----	440 U	470 U				
bis(2-Chloroethyl)ether	ND	-----	440 U	470 U				
bis(2-Ethylhexyl)phthalate	130	390	71 J	470 U				
Butylbenzylphthalate	ND	-----	440 U	470 U				
Carbazole	ND	-----	440 U	470 U				
Chrysene	83	249	120 J	200 J				
Di-n-butylphthalate	ND	-----	440 U	470 U				
Di-n-octylphthalate	ND	-----	440 U	470 U				
Dibenz(a,h)anthracene	ND	-----	440 U	470 U				
Dibenzofuran	ND	-----	440 U	470 U				
Diethylphthalate	ND	-----	440 U	470 U				
Dimethylphthalate	ND	-----	440 U	470 U				
Fluoranthene	68	204	210 J C-BSQL	430 J C-BSQL				
Fluorene	ND	-----	440 U	470 U				
Hexachlorobenzene	ND	-----	440 U	470 U				
Hexachlorobutadiene	ND	-----	440 U	470 U				
Hexachlorocyclopentadiene	ND	-----	440 U	470 U				
Hexachloroethane	ND	-----	440 U	470 U				
Indeno(1,2,3-cd)pyrene	ND	-----	84 J C-BSQL	470 U				
Isophorone	ND	-----	440 U	470 U				
N-Nitroso-di-n-propylamine	ND	-----	440 U	470 U				
N-Nitrosodiphenylamine	ND	-----	440 U	470 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Naphthalene	ND	-----	440 U	470 U				
Nitrobenzene	ND	-----	440 U	470 U				
Pentachlorophenol	ND	-----	1100 U	1100 U				
Phenanthrene	32	96	120 J C-BSQL	480 C-BSQL				
Phenol	ND	-----	440 U	470 U				
Pyrene	52	156	130 J	260 J C-BSQL				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
4,4'-DDD	ND	-----	4.4 U	4.7 U				
4,4'-DDE	ND	-----	4.4 U	4.7 U				
4,4'-DDT	ND	-----	4.4 U	4.7 U				
Aldrin	ND	-----	2.3 U	2.4 U				
alpha-BHC	ND	-----	2.3 U	2.4 U				
alpha-Chlordane	0.35	1.05	0.54 J	2.4 U				
beta-BHC	ND	-----	1.1 J C-BSQL	0.64 J C-BSQL				
delta-BHC	ND	-----	2.3 U	2.4 U				
Dieldrin	ND	-----	4.4 U	4.7 U				
Endosulfan I	ND	-----	2.3 U	2.4 U				
Endosulfan II	ND	-----	4.4 U	4.7 U				
Endosulfan sulfate	ND	-----	4.4 U	4.7 U				
Endrin	ND	-----	4.4 U	4.7 U				
Endrin aldehyde	ND	-----	4.4 U	4.7 U				
Endrin ketone	ND	-----	4.4 U	4.7 U				
gamma-BHC (lindane)	ND	-----	2.3 U	2.4 U				
gamma-Chlordane	0.34	1.02	1.1 J C-BSQL	2.4 U				
Heptachlor	ND	-----	2.3 U	2.4 U				
Heptachlor epoxide	ND	-----	0.26 J C-BSQL	2.4 U				
Methoxychlor	ND	-----	23 U	24 U				
Toxaphene	ND	-----	230 U	240 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Aroclor-1016	ND	-----	44 U	47 U				
Aroclor-1221	ND	-----	89 U	96 U				
Aroclor-1232	ND	-----	44 U	47 U				
Aroclor-1242	ND	-----	44 U	47 U				
Aroclor-1248	ND	-----	44 U	47 U				
Aroclor-1254	ND	-----	44 U	47 U				
Aroclor-1260	ND	-----	44 U	47 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 MFDP02 08/22/94	SS003 SS003 MFDP03 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
ALUMINUM	9330	27990	8660	11500				
ANTIMONY	8.1	24.3	7.5 UJ	7.8 UJ				
ARSENIC	7.7	23.1	29.7 Jv	20.7 Jv				
BARIUM	4920	14760	18900	14700				
BERYLLIUM	0.7	2.1	0.59	0.86				
CADMIUM	ND	-----	2.6	1.5				
CALCIUM	17300	51900	11100	9230				
CHROMIUM	18.5	55.5	87.1	90.2				
COBALT	9.1	27.3	12.3	12				
COPPER	32.8	98.4	63.8 J	46.9 J				
CYANIDE	ND	-----	0.66 U	0.69 U				
IRON	16400	49200	18800	22000				
LEAD	117	351	345	174				
MAGNESIUM	4200	12600	3460	4430				
MANGANESE	467	1401	530	410				
MERCURY	ND	-----	0.77 J	0.39 J				
NICKEL	27.2	81.6	16.5	19.1				
POTASSIUM	1890	5670	1580	2180				
SELENIUM	0.34	1.02	0.53	0.5				
SILVER	1.9	5.7	2.9	1.8				
SODIUM	164	492	219	490				
THALLIUM	0.53	1.59	0.6 J	0.51				
VANADIUM	23.7	71.1	24.3	29.1				
ZINC	206	618	666	367				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94		SS003 SS003 FDB30 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
2,4-Dinitrotoluene	ND	-----	440	U	470	U				
2,6-Dinitrotoluene	ND	-----	440	U	470	U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,1,1-Trichloroethane	ND	-----	15 U					
1,1,2,2-Tetrachloroethane	ND	-----	15 U					
1,1,2-Trichloroethane	ND	-----	15 U					
1,1-Dichloroethane	ND	-----	15 U					
1,1-Dichloroethene	ND	-----	15 U					
1,2-Dichloroethane	ND	-----	15 U					
1,2-Dichloroethene (total)	ND	-----	15 U					
1,2-Dichloropropane	ND	-----	15 U					
2-Butanone	ND	-----	15 U					
2-Hexanone	ND	-----	15 U					
4-Methyl-2-pentanone	ND	-----	15 U					
Acetone	ND	-----	15 U					
Benzene	ND	-----	15 U					
Bromodichloromethane	ND	-----	15 U					
Bromoform	ND	-----	15 U					
Bromomethane	ND	-----	15 U					
Carbon disulfide	ND	-----	15 U					
Carbon tetrachloride	ND	-----	15 U					
Chlorobenzene	ND	-----	15 U					
Chloroethane	ND	-----	15 U					
Chloroform	ND	-----	15 U					
Chloromethane	ND	-----	15 U					
cis-1,3-Dichloropropene	ND	-----	15 U					
Dibromochloromethane	ND	-----	15 U					
Ethylbenzene	ND	-----	15 U					
Methylene Chloride	ND	-----	15 U					
Styrene	ND	-----	15 U					
Tetrachloroethene	ND	-----	15 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Toluene	ND	-----	15	U					
trans-1,3-Dichloropropene	ND	-----	15	U					
Trichloroethene	ND	-----	15	U					
Vinyl Chloride	ND	-----	15	U					
Xylenes (total)	ND	-----	15	U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
4,4'-DDD	ND	-----	4.9	U					
4,4'-DDE	ND	-----	4.9	U					
4,4'-DDT	ND	-----	4.9	U					
Aldrin	ND	-----	2.5	U					
alpha-BHC	ND	-----	2.5	U					
alpha-Chlordane	0.35	1.05	0.35	J					
beta-BHC	ND	-----	2.5	U					
delta-BHC	ND	-----	2.5	U					
Dieldrin	ND	-----	4.9	U					
Endosulfan I	ND	-----	2.5	U					
Endosulfan II	ND	-----	4.9	U					
Endosulfan sulfate	ND	-----	4.9	U					
Endrin	ND	-----	4.9	U					
Endrin aldehyde	ND	-----	4.9	U					
Endrin ketone	ND	-----	4.9	U					
gamma-BHC (lindane)	ND	-----	2.5	U					
gamma-Chlordane	0.34	1.02	0.34	J					
Heptachlor	ND	-----	O.14	J					
Heptachlor epoxide	ND	-----	2.5	U					
Methoxychlor	ND	-----	25	U					
Toxaphene	ND	-----	250	U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Aroclor-1016	ND	-----	49 U					
Aroclor-1221	ND	-----	100 U					
Aroclor-1232	ND	-----	49 U					
Aroclor-1242	ND	-----	49 U					
Aroclor-1248	ND	-----	49 U					
Aroclor-1254	ND	-----	49 U					
Aroclor-1260	ND	-----	49 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,2,4-Trichlorobenzene	ND	-----	490	U					
1,2-Dichlorobenzene	ND	-----	490	U					
1,3-Dichlorobenzene	ND	-----	490	U					
1,4-Dichlorobenzene	ND	-----	490	U					
2,2'-Oxybis(1-chloropropane)	ND	-----	490	U					
2,4,5-Trichlorophenol	ND	-----	1200	U					
2,4,6-Trichlorophenol	ND	-----	490	U					
2,4-Dichlorophenol	ND	-----	490	U					
2,4-Dimethylphenol	ND	-----	490	U					
2,4-Dinitrophenol	ND	-----	1200	U					
2-Chloronaphthalene	ND	-----	490	U					
2-Chlorophenol	ND	-----	490	U					
2-Methylnaphthalene	ND	-----	490	U					
2-Methylphenol	ND	-----	490	U					
2-Nitroaniline	ND	-----	1200	U					
2-Nitrophenol	ND	-----	490	U					
3,3'-Dichlorobenzidine	ND	-----	490	U					
3-Nitroaniline	ND	-----	1200	U					
4,6-Dinitro-2-methylphenol	ND	-----	1200	U					
4-Bromophenyl-phenylether	ND	-----	490	U					
4-Chloro-3-methylphenol	ND	-----	490	U					
4-Chloroaniline	ND	-----	490	U					
4-Chlorophenyl-phenylether	ND	-----	490	U					
4-Methylphenol	ND	-----	490	U					
4-Nitroaniline	ND	-----	1200	U					
4-Nitrophenol	ND	-----	1200	U					
Acenaphthene	ND	-----	490	U					
Acenaphthylene	ND	-----	490	U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Anthracene	ND	-----	490	U					
Benzo(a)anthracene	33	99	33	J					
Benzo(a)pyrene	ND	-----	490	U					
Benzo(b)fluoranthene	53	159	53	J					
Benzo(g,h,i)perylene	ND	-----	490	U					
Benzo(k)fluoranthene	ND	-----	490	U					
bis(2-Chloroethoxy)methane	ND	-----	490	U					
bis(2-Chloroethyl)ether	ND	-----	490	U					
bis(2-Ethylhexyl)phthalate	130	390	130	J					
Butylbenzylphthalate	ND	-----	490	U					
Carbazole	ND	-----	490	U					
Chrysene	83	249	83	J					
Di-n-butylphthalate	ND	-----	490	U					
Di-n-octylphthalate	ND	-----	490	U					
Dibenz(a,h)anthracene	ND	-----	490	U					
Dibenzofuran	ND	-----	490	U					
Diethylphthalate	ND	-----	490	U					
Dimethylphthalate	ND	-----	490	U					
Fluoranthene	68	204	68	J					
Fluorene	ND	-----	490	U					
Hexachlorobenzene	ND	-----	490	U					
Hexachlorobutadiene	ND	-----	490	U					
Hexachlorocyclopentadiene	ND	-----	490	U					
Hexachloroethane	ND	-----	490	U					
Indeno(1,2,3-cd)pyrene	ND	-----	490	U					
Isophorone	ND	-----	490	U					
N-Nitroso-di-n-propylamine	ND	-----	490	U					
N-Nitrosodiphenylamine	ND	-----	490	U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)
Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94		Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Naphthalene	ND	-----	490	U					
Nitrobenzene	ND	-----	490	U					
Pentachlorophenol	ND	-----	1200	U					
Phenanthrene	32	96	32	J					
Phenol	ND	-----	490	U					
Pyrene	52	156	52	J					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 MFDP01 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
ALUMINUM	9330	27990	9330					
ANTIMONY	8.1	24.3	8.1 J					
ARSENIC	7.7	23.1	7.7 Jv					
BARIUM	4920	14760	4920					
BERYLLIUM	0.7	2.1	0.7					
CADMIUM	ND	-----	1.1 U					
CALCIUM	17300	51900	17300					
CHROMIUM	18.5	55.5	18.5					
COBALT	9.1	27.3	9.1 Jv					
COPPER	32.8	98.4	32.8 J					
CYANIDE	ND	-----	0.71 U					
IRON	16400	49200	16400					
LEAD	117	351	117					
MAGNESIUM	4200	12600	4200					
MANGANESE	467	1401	467					
MERCURY	ND	-----	0.14 UJ					
NICKEL	27.2	81.6	27.2					
POTASSIUM	1890	5670	1890					
SELENIUM	0.34	1.02	0.34					
SILVER	1.9	5.7	1.9					
SODIUM	164	492	164					
THALLIUM	0.53	1.59	0.53					
VANADIUM	23.7	71.1	23.7					
ZINC	206	618	206					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
2,4-Dinitrotoluene	ND	-----	490 U					
2,6-Dinitrotoluene	ND	-----	490 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

REFERENCE 13

~~88543~~

GROUND WATER
IN
LOUISIANA

WATER RESOURCES BULLETIN No. 1

Published by
DEPARTMENT OF CONSERVATION
LOUISIANA GEOLOGICAL SURVEY
and
LOUISIANA DEPARTMENT OF PUBLIC WORKS
Baton Rouge, La.
August 1960

the alluvium on the fringes of the valley. The sharp decrease in the depth of fresh water occurrence (pl. 3) marks the southern limit of flushing by fresh water in Pliocene deposits.

Yields of wells in the deposits of Pliocene age generally are less than those from the overlying Quaternary deposits. The largest known yield from Pliocene deposits in area 1 is about 1,000 gpm from a well at Oakdale, in Allen Parish. Only a few wells have been completed in strata of Pliocene age in area 1 mainly because of the availability of large quantities of water from the overlying Quaternary deposits. The primary reason for the development of this aquifer is to obtain water of a better quality than that from the overlying Quaternary deposits. Two analyses of water from the Pliocene in area 1 are included in table 7. These analyses indicate that the water is of the soft sodium bicarbonate type, but, both samples were greatly discolored, probably due to organic matter, and had a somewhat high total iron content. In addition, water from well Ev-142 contains fluoride in a concentration high enough to cause severe mottling of the teeth of children.

In area 2 many wells are completed in Pliocene deposits to take advantage of the good quality of water and high artesian head. Flowing wells are common throughout this area except in the Baton Rouge area where large withdrawals of water for municipal and industrial supplies have lowered the piezometric surface. The largest yield from the Pliocene sediments in area 2 is a natural flow of about 3,200 gpm from a municipal-supply well at Slidell.

Analyses of water from four wells in area 2 are listed in table 7. These analyses indicate that the water typically is the soft, sodium bicarbonate type. Other chemical constituents vary in concentration areally and with depth. Shallower wells generally yield acid-tending waters with lower dissolved-solids content and greater quantities of iron than water from the deeper wells. Three of the samples of water from area 2 were slightly discolored. This color would not be readily apparent, but one well (SL-166)

yields water which has a color higher than the limit of 20 set by the U.S. Public Health Service.

QUATERNARY SYSTEM

The Quaternary deposits of Louisiana are composed of sediments of Pleistocene and Recent age. The Pleistocene deposits are of two general types; an approximately coastwise, gulfward-thickening wedge of deltaic sediments and the relatively thin, veneerlike deposits which form the stream terraces and alluvial valley fills. The deposits of Recent age form a thin mantle of sand, silt, and clay restricted to stream valleys and coastal areas. The Recent deposits generally are thin and not important as aquifers; therefore, they are not differentiated from the deposits of Pleistocene age on plate 2. The deposits of Pleistocene age that have been divided into formations by Fisk (1938, 1940, and 1944) and Jones (1954) comprise several hydrologic units which do not coincide with the formations.

It is difficult to differentiate between the coastwise Quaternary deposits and the underlying Pliocene deposits in those areas where the basal Quaternary deposits are not gravelly. The lack of distinctive lithologic units at the contact of Pliocene and Quaternary deposits is illustrated by the composite electrical log of the Miocene, Pliocene, and Quaternary deposits (fig. 13). Thus, correlations must be considered approximate because of the lithologic similarity of the two deposits. The Quaternary deposits throughout the State are composed of gravel, sand, silt, and clay and range in thickness from less than 50 feet in central and northern Louisiana to more than 3,500 feet near the coast. They are shown as one unit on the fence diagram (pl. 2).

The Quaternary deposits, which blanket most of Louisiana (pl. 1 and fig. 16), yield about two-thirds of all the ground water pumped in the State. To describe the availability of fresh water the Quaternary deposits have been divided into upland and valley deposits. The relatively thin Quaternary valley deposits fill the major stream valleys and blanket the coastal areas. The Quaternary upland deposits also consist of two major groups—the rela-

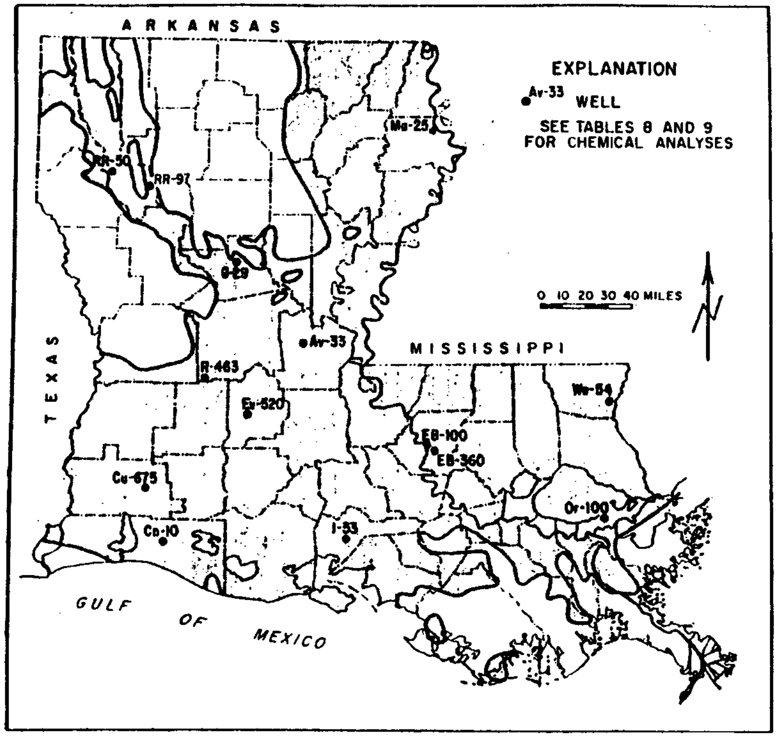


Figure 16. Map showing the approximate area where rocks of the Quaternary system contain fresh water.

tively thin terraced deposits which flank the stream valleys of northern Louisiana and the coastwise terraced deposits which dip and thicken toward the coast. (See pl. 2.)

Quaternary Valley Deposits

The Quaternary valley deposits are recharged mainly from rainfall. The streams that flow across these deposits normally are effluent during most of the year, and groundwater discharge contributes significantly to the base flow of these streams. The hydraulic gradient near the streams is reversed during high-water stages, and the streams become influent for brief periods. However, on a yearly basis the discharge into streams exceeds the recharge from them. The valley deposits are recharged to a small extent from upward movement of water from underlying aquifers of Tertiary age and from lateral movement from adjacent

Quaternary upland deposits. Movement of ground water in the valley deposits is generally toward the major streams and downstream, because of the gradient imposed by topography.

The occurrence of fresh ground water is irregular in the lower Mississippi River valley. (See fig. 16—east of well I-53 and south of well Or-100.) The occurrence of fresh ground water in this area may be related to the positions of ancestral channels of the Mississippi River.

Valley deposits throughout much of the State are composed of sand and gravel near the base and become progressively finer grained toward the top. The basal sand and gravel is a prolific source of water and wells in deposits yield as much as 4,000 gpm.

Analyses of water from five wells completed in Quaternary valley deposits are given in table 8. These analyses show that the water generally is very hard and has a high total iron content. The hardness ranges from 228 ppm to 480 ppm. All the analyses listed in table 8 show a total iron content in excess of the U.S. Public Health Service's recommended limit of 0.3 ppm. However, the potentially high yields of wells in these deposits and the relatively low water temperature make these deposits an excellent source of water for irrigation and some industrial purposes.

Quaternary Upland Deposits

TERRACED DEPOSITS OF NORTHERN LOUISIANA

The terraced deposits which flank the stream val and cap the older formations in northern Louisiana are recharged by local rainfall. Ground water in these deposits generally is under water-table conditions and moves from topographically high positions to local stream valleys.

The terraced deposits generally are composed of a sedimentary sequence which ranges in grain size from coarse at the base to fine at the top, much like the deposits in the valley areas. The lower part of the section in many areas contains gravel, but the yields of wells completed in these deposits, generally are small because of the relatively thin saturated thickness of the deposits.

The analyses of water from two wells (G-29 and RR-97) completed in these deposits are given in table 9, and the locations of the wells are shown on figure 16. Water from these deposits has a very low dissolved-solids content and is soft. Excessive total iron concentrations (greater than 0.3 ppm) would require some treatment to make the water completely suitable for domestic use.

COASTWISE TERRACES AND THEIR SUBSURFACE EQUIVALENTS

The terraced deposits of northern Louisiana coalesce with their coastwise equivalent in the southern third of the State. The coastwise deposits gradually dip and thicken gulfward. These sediments have been named the Chicot reservoir in southwestern Louisiana (Jones, 1954, p. 138). The equivalent but finer textured sequence in southeastern Louisiana is unnamed.

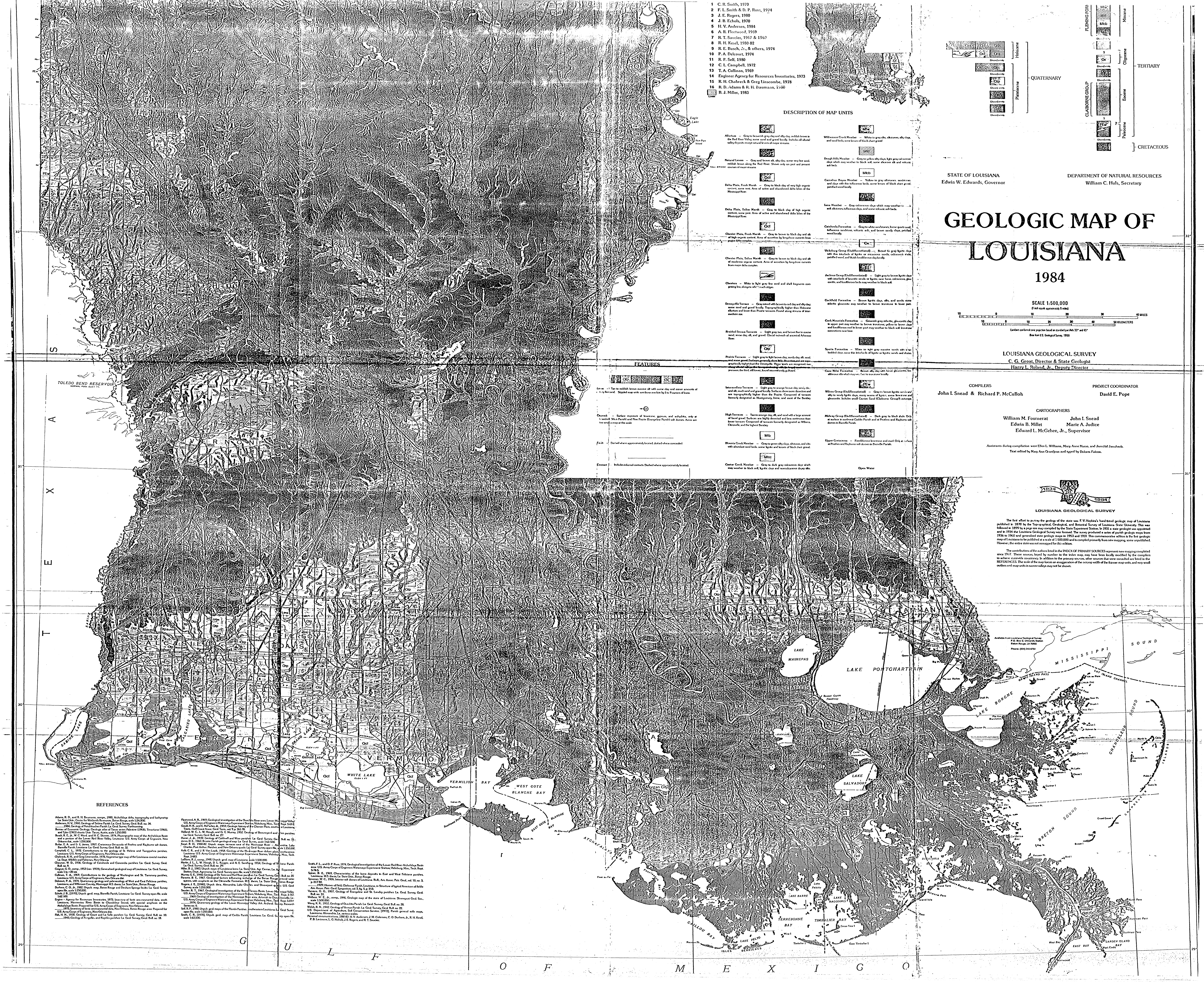
The deposits are recharged mainly by rainfall in the outcrop areas throughout southern Louisiana. In southwestern Louisiana, because of heavy withdrawals there are several additional sources of recharge. These sources of recharge are from water moving through the confining beds (Jones, 1954, p. 170-172) and perennially or periodically from streams that incise the aquifers. Such recharge is undesirable where the water in the streams is salty, such as in the lower Vermilion River (Jones, 1954, p. 164-170). The hydraulic gradient in southwestern Louisiana in the recent past has been toward the Gulf of Mexico; however, heavy withdrawals for irrigation and industry have reversed the gradient along the coast and caused saline waters to move slowly northward. This movement is discussed by Jones (1954, p. 223-225), Fader (1957, p. 21), and Harder (1957, p. 158-160).

The coastal terrace deposits in southeastern Louisiana are a part of a larger hydraulic system. The distribution of head with depth in aquifers in the northern part of the area indicates that water from precipitation enters the terraced deposits, either in the outcrop area or through beds that are only partly confining, and migrates downward through the deposits and into the underlying aquifers. The land surface is underlain by clay in the southern part of

the area; however, some water from precipitation may migrate through this confining bed into the coastal terraced deposits. Deeper aquifers, which contain water under greater hydrostatic head, probably are additional sources of recharge.

Yields of wells completed in these deposits generally are large. The largest yield is about 6,000 gpm from a well for rice irrigation in southwestern Louisiana, where the average yield of irrigation wells is about 1,800 gpm. The potential yield of wells is less in the outcrop area because of the thinning of the aquifer.

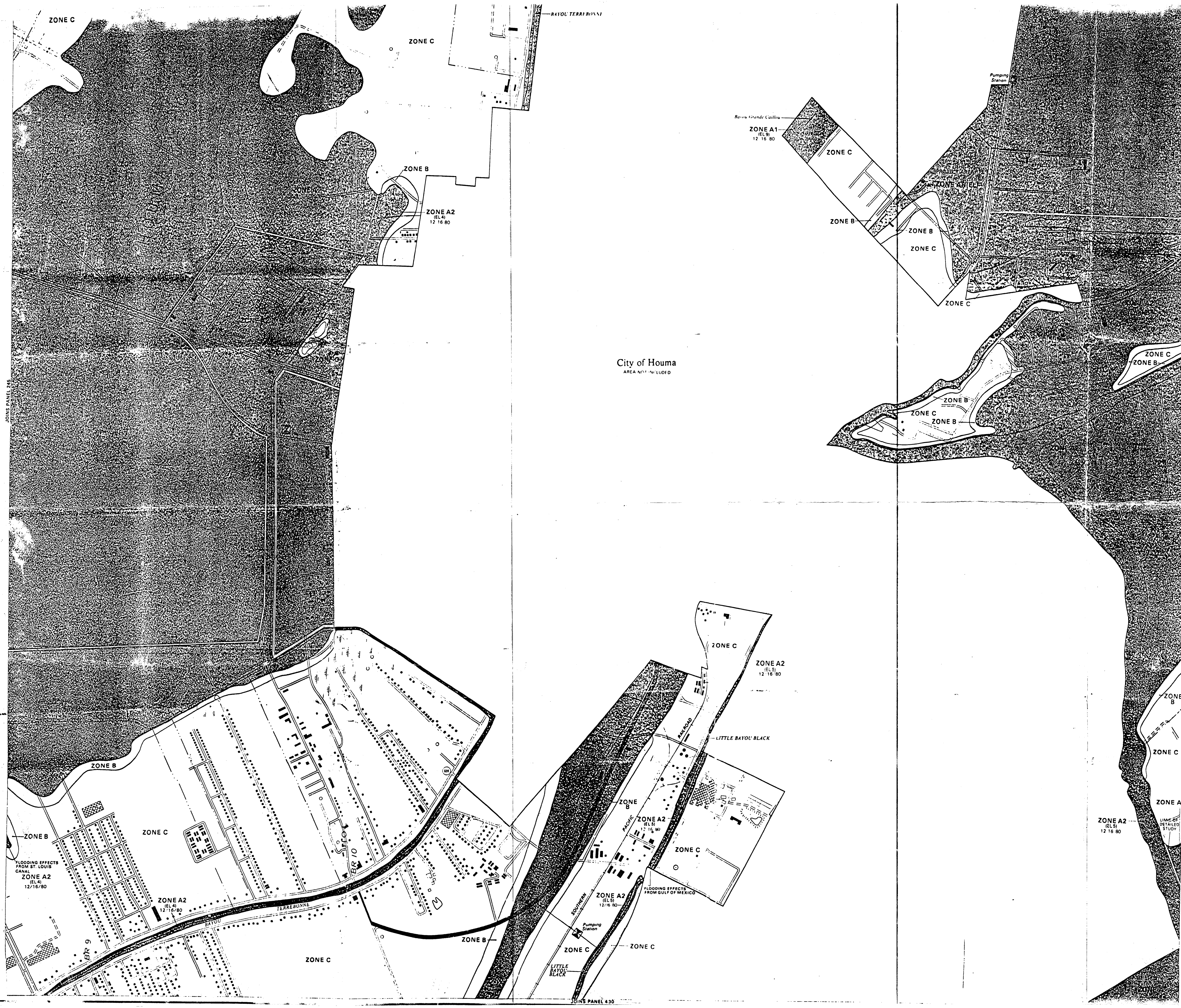
The dissolved-solids content of the water is low in the outcrop areas of the coastal terraced deposits, as typified by the analysis of water from well R-463 (table 9). Mineralization of ground water increases downdip, as indicated by a comparison of the analyses of water from wells R-463 and Wa-54 with those of water from wells in the central and southern parts of the coastal area. (See table 9 and fig. 16.) The deposits in a large part of southwestern Louisiana and the northern part of southeastern Louisiana generally contain water having an objectionable quantity of iron. Wells R-463 and Wa-54, near the outcrop area, yield water having a relatively low pH and a high iron content. The water generally is soft in southeastern Louisiana; however, the water in southwestern Louisiana may increase in hardness as it moves downdip.



GEOLOGIC MAP OF
LOUISIANA
1984
STATE OF LOUISIANA
Edwin W. Edwards, Governor
DEPARTMENT OF NATURAL RESOURCES
William C. Huls, Secretary
SCALE 1:500,000
LOUISIANA GEOLOGICAL SURVEY
C. G. Groat, Director & State Geologist
Harry L. Roland, Jr., Deputy Director
COMPILERS
John I. Snead & Richard P. McCulloh
PROJECT COORDINATOR
David E. Pope
CARTOGRAPHERS
William M. Fournerat
John I. Snead
Edwin B. Millet
Marie A. Judice
Edward L. McGehee, Jr., Supervisor
DESCRIPTION OF MAP UNITS
FEATURES
REFERENCES
1 C. R. Smith, 1970
2 F. L. Smith & D. P. Russ, 1974
3 J. E. Rogers, 1980
4 J. B. Echols, 1970
5 H. V. Andersen, 1984
6 A. R. Fleetwood, 1959
7 R. T. Saucier, 1967 & 1969
8 R. H. Kesel, 1980-82
9 R. E. Busch, Jr., & others, 1974
10 P. A. Delcourt, 1974
11 R. P. Self, 1980
12 C. L. Campbell, 1972
13 T. A. Cullinan, 1969
14 Engineer Agency for Resources Inventories, 1973
15 R. H. Chabreck & Greg Linscombe, 1978
16 R. D. Adams & R. H. Baumann, 1980
17 B. J. Miller, 1983
QUATERNARY
Holocene
Pleistocene
TERTIARY
Miocene
Oligocene
Eocene
Paleocene
CLAIBORNE GROUP
CRETACEOUS
TOLEDO BEND RESERVOIR
LAKE MAUREPAS
LAKE PONTCHARTRAIN
LAKE BORGNE
MISSISSIPPI SOUND
CHANDELEUR SOUND
BRETON SOUND
WHITE LAKE
VERMILION BAY
WEST COTE BLANCHE BAY
EAST COTE BLANCHE BAY
ATCHAFALAYA BAY
TERREBONNE BAY
TIMBALIER BAY
CAILLOU BAY
LAKE SALVADOR
SABINE LAKE
T E X A S
G U L F O F M E X I C O

REFERENCE 14

~~88552~~



500-Year Flood Boundary	ZONE B
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
NOVEMBER 20, 1970

FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
NOVEMBER 20, 1970

FLOOD INSURANCE RATE MAP REVISIONS:

July 1, 1974-to change zone designations.

November 19, 1976-to reflect curvilinear flood boundary, to change community boundary, and to add special flood hazard areas.

December 16, 1980-to increase and decrease base flood elevations, to revise zone designations, and to revise special flood hazard areas.

May 1, 1985- to include the effects of wave action, and to add undeveloped coastal barriers.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TERREBONNE PARISH, LOUISIANA
(UNINCORPORATED AREAS)

PANEL 265 OF 1000
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
225206 0265 C

MAP REVISED:
MAY 1, 1985

FEDERAL EMERGENCY MANAGEMENT AGENCY

REFERENCE 15

~~68558~~

GEOLOGIC DRILL LOG

SITE/SITE ID	PAGE NO.	BORING NO.
DELTA SHIPYARD/HOUMA, LOUISIANA	1 of1	B02

DATE STARTED	DATE FINISHED	DRILLER	DRILL METHOD	BOREHOLE DIAMETER(in)	TOTAL DEPTH(ft)
7/24/96	7/24/96	GEOENVIRONMENTAL	GEOPROBE	2	24.00

GEOLOGIST	GROUND ELEVATION (ft. MSL)	COORDINATES (ft)
DENNIS HAYES		

DEPTH	SAMPLE INTERVAL	RECOVERY(%)	SAMPLE TYPE	SAMPLE ID	BLOW COUNT	HNU	USCS	GRAPHIC LOG	VISUAL DESCRIPTION	DEPTH
		100				50	CL		SANDY CLAY: dark yellow brown, stiff, slightly moist, slightly plastic, oil stained at 2 feet.	
		0				1000			WATER SATURATED: Lost recovery from 4 to 8 feet due to water.	
5										5
		60				1000			CLAY: Olive gray, soft to very soft, saturated, medium plasticity, heavy black oil stained 8 to 20 feet.	
			A	1					Sample B02-51-1 collected from 9 feet at 5:00 pm.	
10						1000				10
		100							Organics present: (roots, wood chips) 12-13, 14-15, 22-23 feet.	
						1000				
15						1000				15
		60								
						1000				
				2		1000				
20		60	A						Sample B02-51-2 collected from 19 feet at 5:10 pm.	20
						1000				
			A	3		1000			Sample B02-51-3 collected from 23 feet at 5:20 pm.	
									B02 TD=24 FEET	

A = ANALYTICAL SAMPLE
C = COMPOSITE SAMPLE
G = GEOTECHNICAL SAMPLE
L = LITHOLOGIC SAMPLE ONLY
R = ARCHIVED SAMPLE

WESTON

GEOLOGIC DRILL LOG

SITE/SITE ID	PAGE NO.	BORING NO.
DELTA SHIPYARD/HOUMA, LOUISIANA	1 of1	B01

DATE STARTED	DATE FINISHED	DRILLER	DRILL METHOD	BOREHOLE DIAMETER(in)	TOTAL DEPTH(ft)
7/24/96	7/24/96	GEOENVIRONMENTAL	GEOPROBE	2	16.00

GEOLOGIST	GROUND ELEVATION (ft. MSL)	COORDINATES (ft)
DENNIS HAYES		

DEPTH	SAMPLE INTERVAL	RECOVERY(%)	SAMPLE TYPE	SAMPLE ID	BLOW COUNT	HNU	USCS	GRAPHIC LOG	VISUAL DESCRIPTION	DEPTH
		100							SANDY CLAY: dark yellow brown, stiff, slightly moist, slightly plastic, sand is very fine grained.	
						1000	CL			
			A	1		1000			Heavy black oil stained 2 to 3.5 feet. Sample B01-51-1, B01-52-1 collected at 2 feet at 10:30 and 10:40 am. Scattered oily sheen to 16 feet.	
									Color change to olive gray. Moist, medium plasticity, soft to very soft.	
		100								
5						1000				5
		100				1000			WATER SATURATION.	
10			A	2		400			Sample B01-51-2 collected from 10 feet at 1330.	10
		100								
						1000				
15						1000				15
									B01 TD=16 feet.	

A = ANALYTICAL SAMPLE
C = COMPOSITE SAMPLE
G = GEOTECHNICAL SAMPLE
L = LITHOLOGIC SAMPLE ONLY
R = ARCHIVED SAMPLE

WESTON

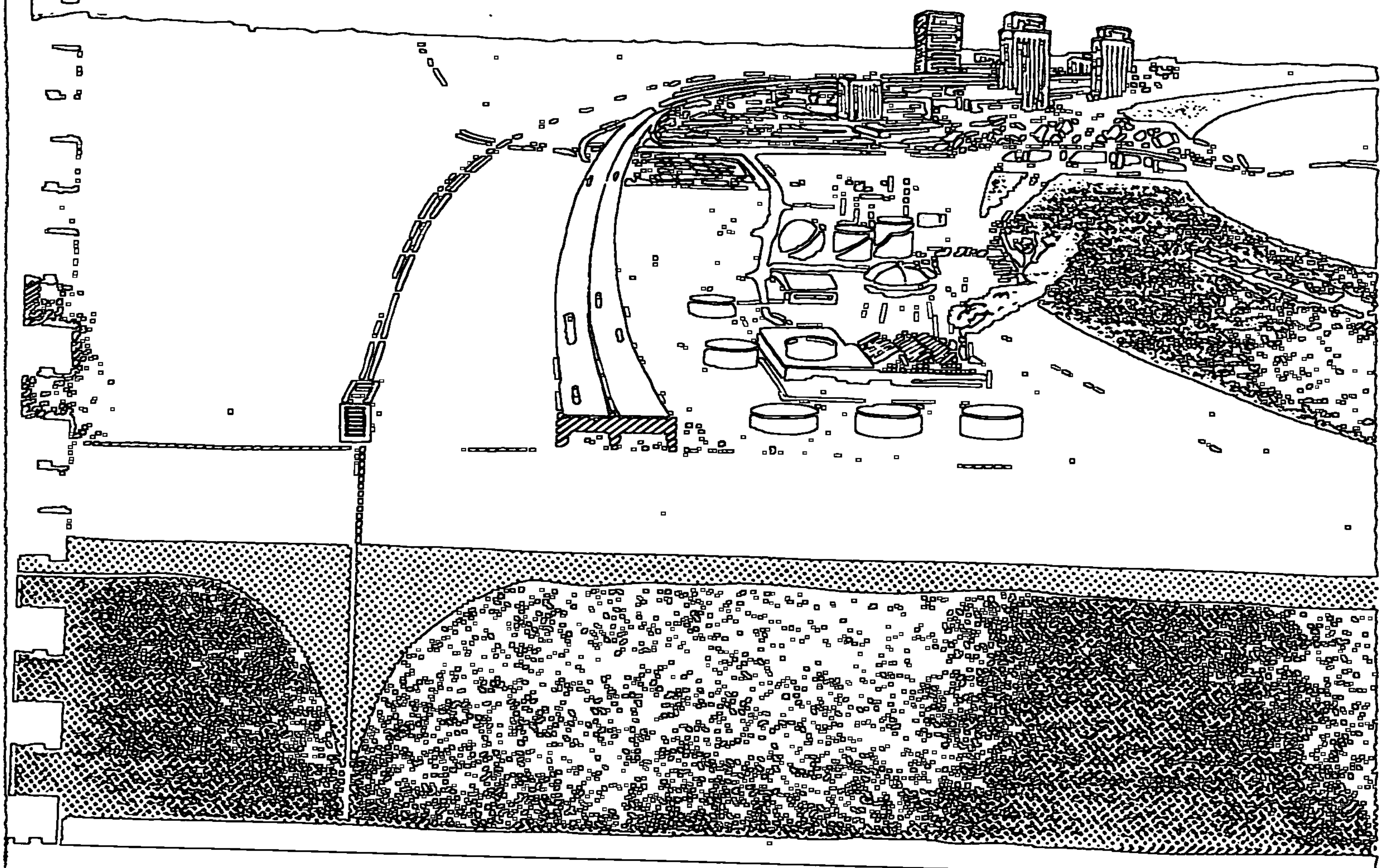
REFERENCE 16

~~88560~~

1004

GROUND WATER RESOURCES AND REQUIREMENTS FOR LOUISIANA

1970-2020



Comprehensive Water and Related Land Resources Study

C.H. Downs, Director
STATE OF LOUISIANA
DEPARTMENT OF PUBLIC WORKS

Series II
Volume II

October 1971

due to salt water in the aquifer, although large quantities of slightly saline to salt water are available for some industrial cooling purposes.

Southeast Sub-Area IV contains the parishes of Assumption, Lafourche, and Terrebonne. The principal water-bearing unit is the Quaternary deposits.

Without regard for transportation costs and political factors, projected requirements (27 mgd in 2020) can be supplied for this sub-area by developing the fresh water aquifers in northern Assumption Parish where most of the withdrawals are presently located. Projected withdrawals will probably cause slight increases in water level declines and chloride content.

There is practically no fresh ground water available, due to the presence of salt water in the aquifers, in Lafourche, Terrebonne, and southern Assumption parishes. However, large quantities of saline water are available for some industrial cooling purposes in this part of the sub-area.

Southeast Sub-Area V contains the parishes of St. Charles, St. John the Baptist, and St. James. The principal water-bearing unit is the Quaternary deposits.

QUATERNARY DEPOSITS

The Quaternary deposits are of three general types: (1) a coastwide, gulfward-thickening wedge of sand, gravel, and clay; (2) a relatively thin veneer-like deposit of sand and gravel which forms the terraced uplands; and (3) the predominantly sand and gravel deposits, capped by clay, which fill the alluvial valleys. The Quaternary deposits range in thickness from less than 50 feet in central and northern Louisiana to more than 3,500 feet near the coast. The maximum depth to which these deposits contain fresh water is about 1,000 feet. The areal distribution of the deposits is shown on Fig. VIII. (The alluvial valley deposits are cross-hatched)

Water in the Quaternary valley deposits originates principally from rainfall on the valley floor and discharges into the streams during most of the year. However, during high stream stages water from the streams enters the valley deposits for brief periods.

Alluvial valley deposits throughout much of the state are composed of sand and gravel near the base and become progressively finer grained toward the top of the deposits. These aquifers are hydraulically connected to master streams; therefore, ground water levels fluctuate with stream levels. The basal sand and gravel is a prolific source of water, and wells in the deposits yield as much as 5,000 gpm. Wells Av-33, Ev-100, I-53, Ma-25, and RR-50, shown in Fig. VIII, are completed in the valley deposits and yield very hard water with a high iron content and a low temperature.

The Quaternary upland deposits flank the stream valleys and cap the older formations in northern Louisiana. These deposits are recharged by local rainfall, and the water moves from topographically high positions to local stream valleys. The grain size of the deposits is similar to those of the valley fill. The lower part of the section in many areas contains gravel, but the yields of wells completed in these deposits generally are small because of the relatively thin saturated thickness of sand and gravel. In some places, however, well yields of 500 to 1,000 gpm are possible. Water from these deposits has a very low dissolved-solids content and is soft; however, excessive iron concentrations require some treatment to make the water completely suitable for domestic use.

The alluvial valley and upland deposits coalesce with the coastwide deposits of southwestern and southeastern Louisiana. These sediments have been named the Chicot acquifer in southwestern Louisiana and the equivalent, but finer textured deposits, in southeastern Louisiana have no equivalent regional name. Prior to large-scale development of ground water in southwestern and southeastern Louisiana, water in these deposits moved southward toward the Gulf. However, heavy withdrawals for irrigation and industry have reversed the direction of flow along the coast, and in some places saline water is moving slowly northward toward areas of development.

Yields of wells completed in these deposits generally are large. The largest yield is about 6,000 gpm from a rice irrigation well in southwestern Louisiana. The potential yield of wells is less near the outcrop area, which occurs approximately at the latitude of northern Evangeline Parish, because of the thinning of the aquifer.

The dissolved-solids content of water is low in the outcrop areas of the coastal deposits, as typified by water from wells of R-463 and well Wa-54. (See Fig. VIII.) The water from these wells has a relatively low pH and high iron content. The water generally is soft in southeastern Louisiana; however, the water in southwestern Louisiana increases in hardness as it moves southward.

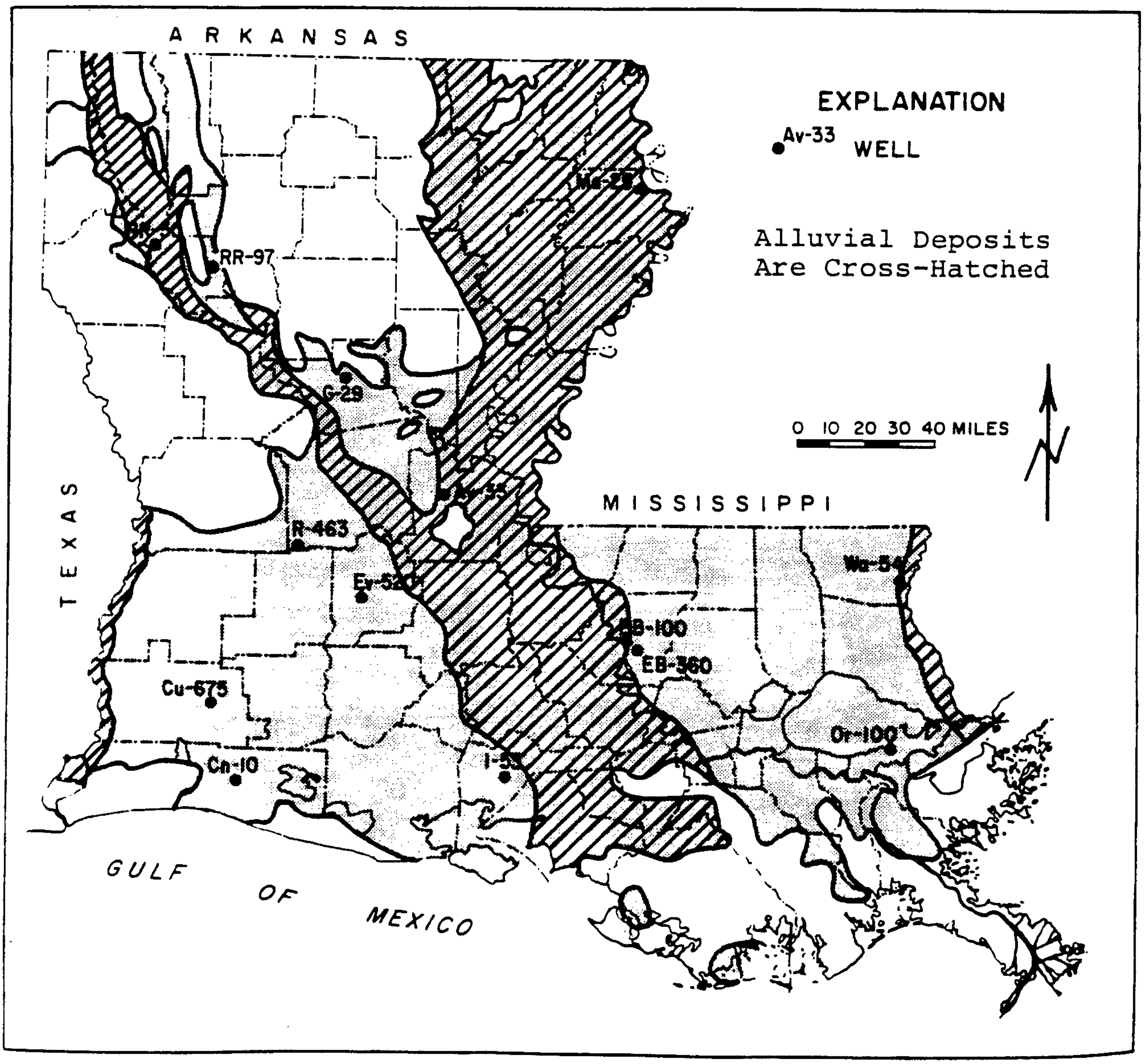


Figure VIII--Approximate Area Where Rocks of the Quarternary System Contain Fresh Water

REFERENCE 17

~~88562~~

2/14/96 LOUISIANA DOTD - WATER WELL REGISTRATION SYSTEM PAGE 1

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER

REQUESTED BY: ROY F. WESTON, INC.

WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	TOWN SECT	SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO	
109	-[redacted]	MOFIVATIT SEAFO PLANT 1	293621 904235	MISSISSIPPI RIVER ALLUVIAL AQUIFER BRADEN PUMP	096	17S	17E	INDUSTRIAL	280 20	6 STEEL	6 260-280	0688	D	W
109	-[redacted]	MOFIVATIT SEAFO PLANT 2	293608 904434	MISSISSIPPI RIVER ALLUVIAL AQUIFER BRADEN PUMP	006	17S	17E	INDUSTRIAL	274 20	8X6 STEEL	6 254-274	0987	D	W
109	-50[redacted]4Z	PATRICK PETRO SHORE 1	293226 903903	MISSISSIPPI RIVER ALLUVIAL AQUIFER WESTRO	057	18S	18E	RIG SUPPLY	260 PA	4	4 250-260	0980		
109	-5[redacted]05Z	GETTY OIL HOUMA 1	293559 904224	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	008	17S	17E	RIG SUPPLY	280 PA			1180		
109	-5008Z	EXXON CO USA MW-9	293625 904431	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	MONITOR	11 --	4 PLASTIC	4 1-11	0790	D	W
109	-5010Z	EXXON CO USA MW-10	293625 904431	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	MONITOR	11 PA	4 PLASTIC	4 1-11	0790	D	W
109	-5[redacted]3Z	SAMEDAN OIL SHORE 1	293227 904051	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	001	18S	17E	RIG SUPPLY	320 PA	4 STEEL	4 300-320	0681		
109	-50[redacted]Z	BLOCKER EXPLORA PELTO 1	293347 904548	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	104	17S	17E	RIG SUPPLY	220 PA	4 STEEL	4 200-220	1081	D	
109	-50[redacted]Z	GETTY OIL HOUMA 9	293534 904354	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	006	17S	17E	RIG SUPPLY	250 PA			1280		
109	-50[redacted]4Z	UNION OIL CALF C GAIDRY 8	293612 904142	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	022	17S	17E	RIG SUPPLY	210 PA	4 PLASTIC	4 200-210	0293	D	W
109	-5[redacted]5Z	GETTY OIL SH18	293512 904342	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	101	17S	17E	OTHER	240 -I	4 STEEL	4 220-240	1281	D	
109	-5[redacted]0Z	MOBIL EXP & PRO BURGUIER 1	293651 904047	MISSISSIPPI RIVER ALLUVIAL AQUIFER BROWN, H.	023	17S	18E	RIG SUPPLY	285 PA	4 PLASTIC	4 265-285	0883	D	W
109	-5[redacted]8Z	COCKRELL OIL SHORE 1	293402 903956	MISSISSIPPI RIVER ALLUVIAL AQUIFER BROWN, H.	020	17S	18E	RIG SUPPLY	205 PA	4 PLASTIC	4 185-205	0784	D	W
109	-5[redacted]1Z	EXCHANGE OIL-GA SOC1	293337 904003	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	020	17S	18E	RIG SUPPLY	240 PA	4 PLASTIC	4 210-240	0883	D	
109	-5[redacted]1Z	LADD PETROLEUM SHORE 1	293405 904119	MISSISSIPPI RIVER ALLUVIAL AQUIFER GUICHARD	012	17S	17E	RIG SUPPLY	160 PA	4 PLASTIC	4 141-161	1084	D	
109	-[redacted]73Z	EPOCH PETRO CULVER 1	293706 904327	MISSISSIPPI RIVER ALLUVIAL AQUIFER GUICHARD	093	17S	17E	RIG SUPPLY	181 PA	4 PLASTIC	4 161-181	0185	D	
109	-5[redacted]Z	DIASU OIL & GAS SHORE 1	293344 903959	MISSISSIPPI RIVER ALLUVIAL AQUIFER BROWN, H.	020	17S	18E	RIG SUPPLY	245 PA	4 PLASTIC	4 225-245	1085	D	W

STD1

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER

REQUESTED BY: ROY F. WESTON, INC.

WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO	
109	-5[redacted]Z	GETTY OIL	293634	MISSISSIPPI RIVER ALLUVIAL AQUIFER					260	4	4	0681	D	
		HOUMA2	904358	RIG WATER	006	17S	17E	OTHER	-I	STEEL	240-260			
109	-5091Z	TE CONSOL GOVT	293318	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					37	2	2	0984	D	W
		BDS MW-1	904343	FUGRO (SE)	011	17S	17E	[redacted]	PA	PLASTIC	27-37			
109	-5092Z	TE CONSOL GOVT	293312	MISS. RIVER ALLUVIAL AQ. SURF. CONFIN[redacted]NIT					37	2	2	0984	D	W
		BDS MW-2	904346	FUGRO (SE)	011	17S	17E	[redacted]	PA	PLASTIC	27-37			
109	-5093Z	TE CONSOL GOVT	293310	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					37	2	2	0984	D	W
		BDS MW-3	904346	FUGRO (SE)	011	17S	17E	[redacted]	PA	PLASTIC	27-37			
109	-5094Z	TE CONSOL GOVT	293308	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					37	2	2	0984	D	W
		BDS MW-4	904341	FUGRO (SE)	011	17S	17E	[redacted]	PA	PLASTIC	27-37			
109	-5095Z	TE CONSOL GOVT	293312	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					37	2	2	0984	D	W
		BDS MW-5	904335	FUGRO (SE)	011	17S	17E	[redacted]	PA	PLASTIC	27-37			
109	-5096Z	TE CONSOL GOVT	293320	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					37	2	2	0984	D	W
		BDS MW-6	904339	FUGRO (SE)	011	17S	17E	[redacted]	PA	PLASTIC	27-37			
109	-50[redacted]Z	M-H OIL & GAS	293333	MISSISSIPPI RIVER ALLUVIAL AQUIFER					230	4	4	1285	D	W
		WALTER 1	903906	RIG WATER	019	17S	18E	RIG SUPPLY	PA	PLASTIC	210-230			
109	-5101Z	WAGUESPACK, M	293420	NO WELL MADE, LOG DEPTH SHOWN					190			0985	D	
			904446	ENDLESS EARTH	104	17S	17E	[redacted]	HH					
109	-5102Z	LEATHERS, W D	293427	NO WELL MADE, LOG DEPTH SHOWN					200			0586	D	
			904432	ENDLESS EARTH	104	17S	17E	[redacted]	HH					
109	-5104Z	BLANCHARD, W	293457	NO WELL MADE, LOG DEPTH SHOWN					220			0685	D	
			904213	ENDLESS EARTH	105	17S	17E	[redacted]	HH					
109	-5112Z	THERIOT, ELLIS	293531	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					17	4	4	0492	D	W
		MW-9	904211	LAYNE (ENV)	008	17S	17E	[redacted]	--	OTHER	2-17			
109	-5[redacted]Z	HALBOUTY ENERGY	293618	MISSISSIPPI RIVER ALLUVIAL AQUIFER					225	4	4	0187	D	W
		PERKINS 1	904036	BROWN, H.	023	17S	18E	RIG SUPPLY	PA	PLASTIC	205-225			
109	-5117Z	MOBIL OIL	293530	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					16	4	4	0887	D	
		MW-1	904435	PSI/PTL	102	17S	17E	[redacted]	--	PLASTIC	1-16			
109	-5118Z	MOBIL OIL	293530	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					16	4	4	0887	D	
		MW-2	904435	PSI/PTL	102	17S	17E	[redacted]	--	PLASTIC	1-16			
109	-5125Z	REDDEN, WARREN	293512	NO WELL MADE, LOG DEPTH SHOWN					250			0388	D	
			904448	ROUYEA'S	102	17S	17E	[redacted]	HH					
109	-5126Z	ARCENEAUX, G	293426	NO WELL MADE, LOG DEPTH SHOWN					240			0388	D	
			904440	ROUYEA'S	104	17S	18E	[redacted]	HH					

2/14/96 LOUISIANA DOTD - WATER WELL REGISTRATION SYSTEM PAGE 3
WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER
REQUESTED BY: ROY F. WESTON, INC.
WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO
109	-5127Z	COASTAL MECHANI	293551 904543	NO WELL MADE, LOG DEPTH SHOWN ROUYEA'S	102	17S	17E	[redacted]	250 HH			0388	D
109	-5132Z	BOURG, DAVID	293507 904458	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	076	17S	17E	[redacted]	230 HH			1087	
109	-5134Z	BONVILLIAN, L	293410 904518	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	003	17S	16E	[redacted]	230 HH			0987	
109	-5139Z	BURNER, MARK	293604 904517	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	101	17S	17E	[redacted]	245 HH			1187	
109	-5140Z	LEDET, RANDY	293132 904423	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	032	18S	17E	[redacted]	200 HH			1087	
109	-5141Z	TABOR, JIM	293509 904459	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	076	17S	17E	[redacted]	205 HH			1187	
109	-5144Z	DOYLE, ALEXANDR	293414 904453	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	104	17S	17E	[redacted]	200 HH			0887	
109	-5145Z	DUVAL, STANWOOD	293416 904443	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	104	17S	17E	[redacted]	220 HH			0887	
109	-5147Z	SIBILLE, FRED	293418 904434	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	104	17S	17E	[redacted]	200 HH			0488	
109	-5148Z	DAVIS, GENE	293512 904458	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	076	17S	17E	[redacted]	200 HH			0488	
109	-5151Z	SCHEXNAIDER'S MW-1	293447 904151	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	105	17S	17E	[redacted]	16 --	4 PLASTIC	4 1-16	1188	D W
109	-5152Z	SCHEXNAIDER'S MW-2	293447 904151	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	105	17S	17E	[redacted]	16 --	4 PLASTIC	4 1-16	1188	D W
109	-5153Z	SCHEXNAIDER'S MW-3	293447 904151	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	105	17S	17E	[redacted]	16 --	4 PLASTIC	4 1-16	1188	D W
109	-5154Z	SCHEXNAIDER'S MW-4	293447 904151	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	105	17S	17E	[redacted]	16 --	4 PLASTIC	4 1-16	1188	D W
109	-5155Z	SCHEXNAIDER'S MW-5	293447 904151	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	105	17S	17E	[redacted]	16 --	4 PLASTIC	4 1-16	1188	D W
109	-5156Z	SCHEXNAIDER'S MW-6	293447 904151	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	105	17S	17E	[redacted]	16 --	4 PLASTIC	4 1-16	1188	D W
109	-5[illegible]1Z	HILLARD PETRO HOUMA 1	293511 904222	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	008	17S	17E	RIG SUPPLY	200 --	4 PLASTIC	4 190-200	0492	D W

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER
REQUESTED BY: ROY F. WESTON, INC.
WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME / OWNER'S NO.	LATITUDE / LONGITUDE	GEOLOGIC UNIT / DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH / SUB USE	CASING DIAMETER / MATERIAL	SCREEN DIAMETER / INTERVAL	DRILL DATE	AVAIL INFO
109	-5162Z	INTRACOASTAL	293448	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					14	4	4	0593	D W
		MW-4	904321	GRIFFITH, TOM	101	17S	17E	[redacted]	--	PLASTIC	4-14		
109	-5163Z	INTRACOASTAL	293448	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					13	4	4	0593	D W
		MW-5	904321	GRIFFITH, TOM	101	17S	17E	[redacted]	--	PLASTIC	3-13		
109	-5164Z	INTRACOASTAL	293448	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					12	4	4	0593	D W
		MW-6	904321	GRIFFITH, TOM	101	17S	17E	[redacted]	--	PLASTIC	2-12		
109	-5165Z	INTRACOASTAL	293448	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					12	4	4	0593	D W
		MW-7	904321	GRIFFITH, TOM	101	17S	17E	[redacted]	--	PLASTIC	2-12		
109	-5166Z	THOMPSON, DALE	293548	NO WELL MADE, LOG DEPTH SHOWN					250			0189	D
			904546	ACTION	102	17S	17E	[redacted]	HH				
109	-5[illegible]68Z	LEGACY OPERATE	293721	MISSISSIPPI RIVER ALLUVIAL AQUIFER					225	4	4	0489	D W
		KRUMBHAR 1	904115	BROWN, H.	025	17S	17E	RIG SUPPLY	PA	PLASTIC	205-225		
109	-5171Z	NORMAN, DAVID	293418	NO WELL MADE, LOG DEPTH SHOWN					230			0389	D
			904406	ENDLESS EARTH	103	17S	17E	[redacted]	HH				
109	-5172Z	RHODES, CALVIN	293422	NO WELL MADE, LOG DEPTH SHOWN					240			0888	D
			904419	ENDLESS EARTH	103	17S	17E	[redacted]	HH				
109	-5174Z	BARRETT, HERB	293425	NO WELL MADE, LOG DEPTH SHOWN					200			0489	D
			904408	ENDLESS EARTH	103	17S	17E	[redacted]	HH				
109	-5[illegible]5Z	TERRA RESOURCES	293606	MISSISSIPPI RIVER ALLUVIAL AQUIFER					225	4	4	0489	D W
		COLE 1	904013	BROWN, H.	022	17S	18E	RIG SUPPLY	PA	PLASTIC	205-225		
109	-5177Z	LEBLANC, TRACY	293415	NO WELL MADE, LOG DEPTH SHOWN					230			0589	D
			904416	ENDLESS EARTH	103	17S	17E	[redacted]	HH				
109	-5180Z	LA DEQ	293547	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					14	4	4	1089	D W
		MW-1	904118	WARE LIND	009	17S	17E	[redacted]	EX	PLASTIC	4-14		
109	-5181Z	LA DEQ	293547	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					14	4	4	1089	D W
		MW-2	904118	WARE LIND	009	17S	17E	[redacted]	EX	PLASTIC	4-14		
109	-5182Z	LA DEQ	293547	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					15	4	4	1089	D W
		MW-3	904118	WARE LIND	009	17S	17E	[redacted]	--	PLASTIC	5-15		
109	-5183Z	LA DEQ	293547	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					11	4	4	1089	D W
		MW-4	904118	WARE LIND	009	17S	17E	[redacted]	--	PLASTIC	1-11		
109	-5184Z	LA DEQ	293547	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					13	4	4	1089	D W
		MW-5	904118	WARE LIND	009	17S	17E	[redacted]	--	PLASTIC	3-13		
109	-5185Z	LA DEQ	293547	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					12	4	4	1089	D W
		MW-6	904118	WARE LIND	009	17S	17E	[redacted]	--	PLASTIC	2-12		

2/14/96 LOUISIANA DOTD - WATER WELL REGISTRATION SYSTEM PAGE 5

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER

REQUESTED BY: ROY F. WESTON, INC.

WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO
109	-5189Z	BREAUX, GLENN	293413 904524	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	104	17S	17E	[redacted]	205 HH			1089	D
109	-5201Z	LA UNEMPLOYMENT	293550 904315	NO WELL MADE, LOG DEPTH SHOWN ENDLESS EARTH	007	17S	17E	[redacted]	250 HH			0691	D
109	-5202Z	DAILEY PETRO SE MW-1	293556 904533	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENCOR	102	17S	17E	[redacted]	8 --	2 PLASTIC	 1-8	0590	D W
109	-5203Z	DAILEY PETRO SE MW-2	293556 904533	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENCOR	102	17S	17E	[redacted]	8 --	2 PLASTIC	 1-8	0590	D W
109	-5204Z	DAILEY PETRO SE MW-3	293556 904533	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENCOR	102	17S	17E	[redacted]	8 --	2 PLASTIC	 1-8	0590	D W
109	-5205Z	DAILEY PETRO SE MW-4	293556 904533	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENCOR	102	17S	17E	[redacted]	8 --	2 PLASTIC	 1-8	0590	D W
109	-5206Z	EXXON CO USA MW-5	293624 904434	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	[redacted]	11 PA	4 PLASTIC	4 1-11	1289	D W
109	-5207Z	EXXON CO USA MW-6	293624 904434	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	[redacted]	11 PA	4 PLASTIC	4 1-11	1289	D W
109	-5208Z	EXXON CO USA MW-7	293624 904434	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	[redacted]	11 PA	4 PLASTIC	4 1-11	1289	D W
109	-5209Z	EXXON CO USA MW-8	293624 904434	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	[redacted]	11 PA	4 PLASTIC	4 1-11	1289	D W
109	-5217Z	TORCH ENERGY TP-1	293409 904158	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT G & E	012	17S	17E	[redacted]	10 --	2 PLASTIC	2 3-10	1290	D W
109	-5218Z	TORCH ENERGY TP-2	293412 904159	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT G & E	012	17S	17E	[redacted]	7 --	2 PLASTIC	2 2-7	1290	D W
109	-5219Z	TORCH ENERGY TP-3	293415 904158	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT G & E	012	17S	17E	[redacted]	10 --	2 PLASTIC	2 3-10	1290	D W
109	-5226Z	STAR ENTERPRISE MW-1	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER	004	17S	18E	[redacted]	16 PA	2 PLASTIC	2 1-16	1190	D W
109	-5227Z	STAR ENTERPRISE MW-2	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER	004	17S	18E	[redacted]	16 PA	2 PLASTIC	2 1-16	1190	D W
109	-5228Z	STAR ENTERPRISE MW-3	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER	004	17S	18E	[redacted]	16 PA	2 PLASTIC	2 1-16	1190	D W
109	-5229Z	STAR ENTERPRISE MW-4	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER	004	17S	18E	[redacted]	16 PA	2 PLASTIC	2 1-16	1190	D W

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER
REQUESTED BY: ROY F. WESTON, INC.
WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO	
109	-5230Z	STAR ENTERPRISE MW-5	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER	004	17S	18E	[redacted]	16 PA	2 PLASTIC	2 1-16	1190	D	W
109	-5243Z	CONOCO MW-1	293609 904257	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	007	17S	17E	[redacted]	14 --	2 PLASTIC	2 1-14	0291	D	W
109	-5244Z	CONOCO MW-2	293609 904257	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	007	17S	17E	[redacted]	14 --	2 PLASTIC	2 1-14	0291	D	W
109	-5245Z	CONOCO MW-3	293609 904257	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	007	17S	17E	[redacted]	14 --	2 PLASTIC	2 1-14	0291	D	W
109	-5246Z	CONOCO MW-4	293609 904257	MISS. RIVER ALLUVIAL AQ. SURF. [redacted] UNIT PSI/PTL	007	17S	17E	[redacted]	14 --	2 PLASTIC	2 1-14	0291	D	W
109	-5247Z	EXXON CO USA MW-9	293625 904434	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	[redacted]	11 PA	4 PLASTIC	4 1-11	0291	D	W
109	-5248Z	EXXON CO USA MW-11	293625 904434	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT PSI/PTL	005	17S	17E	[redacted]	11 PA	4 PLASTIC	4 1-11	0291	D	W
109	-[redacted]5Z	TEXACO SOUTHDOW20	293554 904505	MISSISSIPPI RIVER ALLUVIAL AQUIFER RIG WATER	101	17S	17E	RIG SUPPLY	220 PA	4 PLASTIC	4 210-220	0291	D	W
109	-5263Z	TE CONSOL GOVT A3-MW16-28	293114 904016	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT FUGRO (SE)	079	18S	18E	[redacted]	28 --	2 PLASTIC	2 23-28	0391	D	W
109	-5264Z	TE CONSOL GOVT A3-MW17-28	293125 904022	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT FUGRO (SE)	079	18S	18E	[redacted]	28 --	2 PLASTIC	2 23-28	0391	D	W
109	-5265Z	TE CONSOL GOVT A3-MW18-33	293133 904021	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT FUGRO (SE)	079	18S	18E	[redacted]	33 --	2 PLASTIC	2 28-33	0391	D	W
109	-5266Z	TE CONSOL GOVT A3-MW19-33	293140 904020	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT FUGRO (SE)	079	18S	18E	[redacted]	33 --	2 PLASTIC	2 28-33	0391	D	W
109	-5267Z	TE CONSOL GOVT A3-MW20-28	293143 904017	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT FUGRO (SE)	059	18S	18E	[redacted]	28 --	2 PLASTIC	2 23-28	0391	D	W
109	-5268Z	TE CONSOL GOVT A3-MW21-28	293143 904013	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT FUGRO (SE)	059	18S	18E	[redacted]	28 --	2 PLASTIC	2 23-28	0391	D	W
109	-5[redacted]70Z	LA DEQ MW-2A	293547 904118	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT AQUATERRA, INC.	009	17S	17E	RECOVERY	20 --	4 PLASTIC	4 5-15	0991	D	W
109	-5271Z	S CENTRAL BELL MW-1	293512 904150	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT EUSTIS	101	17S	17E	[redacted]	9 --	4 PLASTIC	4 4-9	0192	D	W
109	-5272Z	S CENTRAL BELL MW-2	293512 904150	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT EUSTIS	101	17S	17E	[redacted]	12 --	4 PLASTIC	4 4-12	0192	D	W

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER
REQUESTED BY: ROY F. WESTON, INC.
WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME / OWNER'S NO.	LATITUDE / LONGITUDE	GEOLOGIC UNIT / DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH / SUB USE	CASING DIAMETER / MATERIAL	SCREEN DIAMETER / INTERVAL	DRILL DATE	AVAIL INFO	
109	-5273Z	S CENTRAL BELL	293512	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					9	4	4	0192	D	W
		MW-3	904150	EUSTIS	101	17S	17E	[redacted]	--	PLASTIC	4-9			
109	-5274Z	S CENTRAL BELL	293512	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					8	4	4	0192	D	W
		MW-4	904150	EUSTIS	101	17S	17E	[redacted]	--	PLASTIC	4-8			
109	-5275Z	S CENTRAL BELL	293512	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					8	4	4	0192	D	W
		MW-5	904150	EUSTIS	101	17S	17E	[redacted]	--	PLASTIC	4-8			
109	-5276Z	LA DOTD	293557	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					16	2	2	0392	D	W
		MW-1	904242	EUSTIS	007	17S	17E	[redacted]	PA	PLASTIC	3-13			
109	-5277Z	LA DOTD	293557	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					16	2	2	0392	D	W
		MW-2	904242	EUSTIS	007	17S	17E	[redacted]	--	PLASTIC	3-13			
109	-5278Z	LA DOTD	293557	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					16	2	2	0392	D	W
		MW-3	904242	EUSTIS	007	17S	17E	[redacted]	--	PLASTIC	3-13			
109	-5279Z	PENROD DRLG	293404	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					22	4	4	0392	D	W
		MW-1	904219	G & E	012	17S	17E	[redacted]	--	PLASTIC	2-22			
109	-5280Z	PENROD DRLG	293406	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					22	4	4	0392	D	W
		MW-2	904217	G & E	012	17S	17E	[redacted]	--	PLASTIC	2-22			
109	-5281Z	PENROD DRLG	293402	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					22	4	4	0392	D	W
		MW-3	904214	G & E	012	17S	17E	[redacted]	--	PLASTIC	2-22			
109	-5282Z	PENROD DRLG	293405	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					22	4	4	0392	D	W
		MW-4	904210	G & E	012	17S	17E	[redacted]	--	PLASTIC	1-22			
109	-5283Z	PENROD DRLG	293405	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					23	4	4	0392	D	W
		MW-5	904203	G & E	012	17S	17E	[redacted]	--	PLASTIC	2-23			
109	-5284Z	INTERCOASTAL	293449	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					14	4	4	0590		W
		MW-1	904322	SHELNUTT	101	17S	17E	[redacted]	--	PLASTIC	4-14			
109	-5285Z	INTERCOASTAL	293449	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					14	4	4	0590		W
		MW-2	904322	SHELNUTT	101	17S	17E	[redacted]	--	PLASTIC	4-14			
109	-5286Z	INTERCOASTAL	293449	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					14	4	4	0590		W
		MW-3	904322	SHELNUTT	101	17S	17E	[redacted]	--	PLASTIC	4-14			
109	-5288Z	EXXON CO USA	293624	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					11	4		0388		
		MW-1	904434	LAYNE (MS)	005	17S	17E	[redacted]	PA					
109	-5289Z	EXXON CO USA	293624	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					11	4		0388		
		MW-3	904434	LAYNE (MS)	005	17S	17E	[redacted]	PA					
109	-5293Z	CONOCO	293534	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT					20	4	4	0392	D	W
		MW-1	904253	LAYNE (ENV)	007	17S	17E	[redacted]	--	PLASTIC	2-20			

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER

REQUESTED BY: ROY F. WESTON, INC.

WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO	
109	-5294Z	CONOCO MW-2	293534 904253	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT LAYNE (ENV)	007	17S	17E	[redacted]	20 --	4 PLASTIC	4 2-20	0392	D	W
109	-5295Z	CONOCO MW-3	293534 904253	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT LAYNE (ENV)	007	17S	17E	[redacted]	20 --	4 PLASTIC	4 2-20	0392	D	W
109	-5317Z	CHAUVIN FUNERAL MW-1	293507 904340	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	101	17S	17E	[redacted]	15 PA	4 PLASTIC	4 5-15	0393	D	W
109	-5318Z	CHAUVIN FUNERAL MW-2	293507 904340	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	101	17S	17E	[redacted]	15 PA	4 PLASTIC	4 5-15	0393	D	W
109	-5319Z	CHAUVIN FUNERAL MW-3	293507 904340	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	101	17S	17E	[redacted]	15 PA	4 PLASTIC	4 5-15	0393	D	W
109	-5320Z	DOWELL SCHLUMBE B-4TD	293440 904249	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	20 --	2 PLASTIC	2 9-19	0691	D	W
109	-5321Z	DOWELL SCHLUMBE B-4TS	293439 904249	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	10 --	2 PLASTIC	2 5-10	0691	D	W
109	-5322Z	DOWELL SCHLUMBE B-5TD	293441 904248	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	20 --	2 PLASTIC	2 15-20	1192	D	W
109	-5323Z	DOWELL SCHLUMBE B-15AT2	293439 904247	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	17 PA	2 PLASTIC	2 12-17	0691	D	W
109	-5324Z	DOWELL SCHLUMBE B-19T2	293441 904246	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	12 PA	2 PLASTIC	2 7-12	0691	D	W
109	-5325Z	DOWELL SCHLUMBE B-27T2	293441 904250	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	10 PA	2 PLASTIC	2 5-10	0691	D	W
109	-5326Z	DOWELL SCHLUMBE BG-1	293441 904250	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	12 PA	2 PLASTIC	2 7-12	0691	D	W
109	-5327Z	DOWELL SCHLUMBE C-1	293440 904249	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GERAGHTY	101	17S	17E	[redacted]	14 --	2 PLASTIC	2 9-14	1192	D	W
109	-5328Z	DIAMOND SHAMROC MW-1	293639 904440	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	005	17S	17E	[redacted]	15 --	4 PLASTIC	4 3-15	0493	D	W
109	-5329Z	DIAMOND SHAMROC MW-2	293639 904440	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	005	17S	17E	[redacted]	15 --	4 PLASTIC	4 3-15	0493	D	W
109	-5330Z	DIAMOND SHAMROC MW-3	293639 904440	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	005	17S	17E	[redacted]	15 --	4 PLASTIC	4 3-15	0493	D	W
109	-5343Z	SHOP RITE MW-10	293507 904444	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENVIRONMENTAL'	102	17S	17E	[redacted]	20 --	2 PLASTIC	2 3-20	1093	D	W

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WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER

REQUESTED BY: ROY F. WESTON, INC.

WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO	
109	-53[redacted]4Z	SHOP RITE RW-1	293507 904444	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENVIRONMENTAL'	102	17S	17E	RECOVERY	12 --	12 PLASTIC	12 3-12	0393	D	W
109	-5[redacted]5Z	SHOP RITE RW-2	293507 904444	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENVIRONMENTAL'	102	17S	17E	RECOVERY	12 --	12 PLASTIC	12 3-12	0393	D	W
109	-53[redacted]Z	SHOP RITE RW-1	293507 904444	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENVIRONMENTAL'	102	17S	17E	RECOVERY	12 --	12 PLASTIC	12 3-12	0393	D	W
109	-5350Z	DIAMOND SHAMROC MW-1	293507 904155	MISS. RIVER ALLUVIAL AQ. SURF. [redacted] UNIT ACADIAN	105	17S	17E	[redacted]	18 --	4 PLASTIC	4 3-18	0394	D	W
109	-5351Z	DIAMOND SHAMROC MW-2	293507 904155	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	105	17S	17E	[redacted]	18 --	4 PLASTIC	4 3-18	0394	D	W
109	-5352Z	DIAMOND SHAMROC MW-3	293507 904155	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	105	17S	17E	[redacted]	18 --	4 PLASTIC	4 3-18	0394	D	W
109	-5357Z	DIAMOND SHAMROC MW-4	293507 904155	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	105	17S	17E	[redacted]	18 --	4 PLASTIC	4 3-18	0494	D	W
109	-5358Z	DIAMOND SHAMROC MW-5	293507 904155	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	105	17S	17E	[redacted]	18 --	4 PLASTIC	4 3-18	0494	D	W
109	-5359Z	DIAMOND SHAMROC MW-6	293507 904155	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ACADIAN	105	17S	17E	[redacted]	18 --	4 PLASTIC	4 3-18	0494	D	W
109	-5360Z	DOWELL SCHLUMBE MW-56	293418 904307	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER/	104	17S	17E	[redacted]	14 --	2 PLASTIC	2 3-13	0893	D	W
109	-5361Z	DOWELL SCHLUMBE MW-57	293418 904307	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER/	104	17S	17E	[redacted]	14 --	2 PLASTIC	2 3-13	0893	D	W
109	-5362Z	DOWELL SCHLUMBE MW-58	293418 904307	MISS. RIVER ALLUVIAL AQ. SURF. [redacted] UNIT GROUNDWATER/	104	17S	17E	[redacted]	16 --	2 PLASTIC	2 5-15	0893	D	W
109	-5363Z	DOWELL SCHLUMBE MW-60	293418 904307	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT GROUNDWATER/	104	17S	17E	[redacted]	14 --	2 PLASTIC	2 3-13	0893	D	W
109	-5367Z	SHOP RITE MW-5	293507 904444	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT ENVIRONMENTAL'	102	17S	17E	[redacted]	13 --	4 PLASTIC	4 3-13	0694	D	W
109	-5368Z	STAR ENTERPRISE MW-6	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT EMON	004	17S	18E	[redacted]	10 PA	4 PLASTIC	 1-10	0192		
109	-5369Z	STAR ENTERPRISE MW-7	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT EMON	004	17S	18E	[redacted]	10 PA	4 PLASTIC	 1-10	0192		
109	-5370Z	STAR ENTERPRISE MW-8	293527 904043	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT EMON	004	17S	18E	[redacted]	10 PA	4 PLASTIC	 1-10	0192		

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER

REQUESTED BY: ROY F. WESTON, INC.

WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME / OWNER'S NO.	LATITUDE / LONGITUDE	GEOLOGIC UNIT / DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH / SUB USE	CASING DIAMETER / MATERIAL	SCREEN DIAMETER / INTERVAL	DRILL DATE	AVAIL INFO
109	-5371Z	STAR ENTERPRISE	293527	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	17	4		0492	
		MW-9	904043	LAYNE (ENV)	004	17S	18E	[redacted]	PA	PLASTIC	2-17		
109	-5372Z	STAR ENTERPRISE	293527	MISS. RIVER ALLUVIAL AQ. SURF.				CON[redacted]IT	12	1.25		1092	
		PZ-1	904043	PRO-TECH	004	17S	18E	[redacted]	PA	PLASTIC	2-12		
109	-5373Z	STAR ENTERPRISE	293527	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	12	1.25		1092	
		PZ-2	904043	PRO-TECH	004	17S	18E	[redacted]	PA	PLASTIC	2-12		
109	-5374Z	TE SCHOOL BOARD	293548	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	14	4	4	0394	D W
		MW-1	904434	ENVIRONMENTAL'	101	17S	17E	[redacted]	PA	PLASTIC	4-14		
109	-5375Z	TE SCHOOL BOARD	293548	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	13	2	2	0192	D W
		MW-1A	904433	ENVIRONMENTAL'	101	17S	17E	[redacted]	PA	PLASTIC	3-13		
109	-5376Z	TE SCHOOL BOARD	293549	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	13	4	4	0790	D W
		MW-2	904433	ENVIRONMENTAL'	101	17S	17E	[redacted]	PA	PLASTIC	3-13		
109	-5377Z	TE SCHOOL BOARD	293548	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	13	4	4	0790	D W
		MW-3	904433	ENVIRONMENTAL'	101	17S	17E	[redacted]	PA	PLASTIC	3-13		
109	-5378Z	LA DOTD	293553	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	13	4	4	1194	D W
		MW-1R	904220	EUSTIS	008	17S	17E	[redacted]	--	PLASTIC	3-13		
109	-5379Z	LA DOTD	293553	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	13	4	4	1194	D W
		MW-2R	904220	EUSTIS	008	17S	17E	[redacted]	--	PLASTIC	3-13		
109	-5380Z	LA DOTD	293553	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	13	4	4	1094	D W
		MW-4R	904220	EUSTIS	008	17S	17E	[redacted]	--	PLASTIC	3-13		
109	-5381Z	LA DOTD	293553	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	13	4	4	1094	D W
		MW-5R	904220	EUSTIS	008	17S	17E	[redacted]	--	PLASTIC	3-13		
109	-5382Z	LA DOTD	293557	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	16	4	4	1194	D W
		MW-1R	904242	EUSTIS	008	17S	17E	[redacted]	--	PLASTIC	6-16		
109	-5383Z	LA DOTD	293557	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	16	4	4	1194	D W
		MW-2R	904242	EUSTIS	008	17S	17E	[redacted]	--	PLASTIC	6-16		
109	-5384Z	LA DOTD	293557	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	16	4	4	1194	D W
		MW-3R	904242	EUSTIS	008	17S	17E	[redacted]	--	PLASTIC	6-16		
109	-5385Z	LA DOTD	293554	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	12	4	4	0192	D W
		MW-1	904221	IT CORPORATION	008	17S	17E	[redacted]	PA	PLASTIC	2-12		
109	-5386Z	LA DOTD	293554	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	12	4	4	0192	D W
		MW-2	904221	IT CORPORATION	008	17S	17E	[redacted]	PA	PLASTIC	2-12		
109	-5387Z	LA DOTD	293554	MISS. RIVER ALLUVIAL AQ. SURF.				CONFINING UNIT	12	4	4	0192	D W
		MW-3	904221	IT CORPORATION	008	17S	17E	[redacted]	PA	PLASTIC	2-12		

LOUISIANA DEPARTMENT OF TR PORTATION AND DEVELOPMENT

BATON ROUGE

2/14/96 LOUISIANA DOTD - WATER WELL REGISTRATION SYSTEM PAGE 11

WELLRQ1A - REGISTERED WATER WELLS IN TERREBONNE -- SORTED BY WELL NUMBER

REQUESTED BY: ROY F. WESTON, INC.

WITHIN A 4.0000 MILE RADIUS OF LATITUDE 293409 LONGITUDE 904218

PARISH CODE	WELL NUMBER	OWNER'S NAME OWNER'S NO.	LATITUDE LONGITUDE	GEOLOGIC UNIT DRILLER	SECT	TOWN SHIP	RANGE	WELL USE	DEPTH SUB USE	CASING DIAMETER MATERIAL	SCREEN DIAMETER INTERVAL	DRILL DATE	AVAIL INFO
109	-5388Z	LA DOTD MW-4	293554 904221	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT IT CORPORATION	008	17S	17E	[redacted]	12 PA	4 PLASTIC	4 2-12	0192	D W
109	-5389Z	LA DOTD MW-5	293554 904221	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT IT CORPORATION	008	17S	17E	[redacted]	12 PA	4 PLASTIC	4 2-12	0192	D W
109	-5391Z	TIME SAVER MW-1	293552 904143	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT SOIL TESTING	008	17S	17E	[redacted]	10 --	4 PLASTIC	4 2-10	0395	D W
109	-5395Z	WALKER, J & SON MW-1	293545 904309	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	007	17S	17E	[redacted]	15 --	4 PLASTIC	4 5-15	0295	D W
109	-5396Z	WALKER, J & SON MW-2	293546 904309	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	007	17S	17E	[redacted]	15 --	4 PLASTIC	4 5-15	0295	D W
109	-5397Z	WALKER, J & SON MW-3	293545 904311	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	007	17S	17E	[redacted]	15 --	4 PLASTIC	4 5-15	0295	D W
109	-5398Z	WALKER, J & SON MW-4	293545 904310	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	007	17S	17E	[redacted]	15 --	4 PLASTIC	4 5-15	0295	D W
109	-5399Z	WALKER, J & SON MW-5	293545 904309	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT STOVER	007	17S	17E	[redacted]	15 --	4 PLASTIC	4 5-15	0295	D W
109	-5404Z	TEXACO MW-1	293721 904120	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT BEST	020	17S	17E	[redacted]	18 --	2 PLASTIC	2 3-18	0895	D W
109	-5405Z	TEXACO MW-2	293721 904120	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT BEST	020	17S	17E	[redacted]	18 --	2 PLASTIC	2 3-18	0895	D W
109	-5406Z	TEXACO MW-3	293721 904120	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT BEST	020	17S	17E	[redacted]	15 --	2 PLASTIC	2 2-15	0895	D W
109	-5407Z	TEXACO MW-4	293721 904120	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT BEST	020	17S	17E	[redacted]	15 --	2 PLASTIC	2 2-15	0895	D W
109	-5417Z	WALKER, J & SON MW-6	293546 904310	MISS. RIVER ALLUVIAL AQ. SURF. CONFINING UNIT HYDRO	007	17S	17E	[redacted]	14 --	4 PLASTIC	4 4-14	1295	D W

NUMBER OF WELLS SELECTED IN PARISH = 183

REFERENCE 18

~~88564~~

SERIES 1956, NO. 1
ISSUED FEBRUARY 1960

SOIL SURVEY

Terrebonne Parish

LOUISIANA

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
LOUISIANA AGRICULTURAL EXPERIMENT STATION

Contents

1956, No. 1

Issued February 1960

ridges, and extensive swamps and marshes. The wet coastal marshes and swamps range from sea level to about 3 feet in elevation. They are frequently inundated by overflow from the streams or by tides. These low areas make up about 91 percent of the parish.

The areas suited to crops are on the low natural levee ridges in the northern and eastern parts of the parish. Near Schriever, some of the ridges are 16 feet high, but they become progressively lower and narrower as they extend from north to south.

This coastal parish is an area of slow subsidence. This subsidence is shown by the double islands which were former natural levee ridges, the numerous lakes and bays, the excessively wide channels of streams along the coastline, the submerged reefs, and the wearing away of the coastal islands and coastline *(2)*.[1] In the southeastern and east-central parts of the parish, some narrow natural levee ridges once used for cultivation are now subject to flooding.

Terrebonne Parish is generally poorly drained. The channels of many of the streams, bayous, and canals are at or near the level of the gulf and do not remove water effectively. The Lower Atchafalaya River, the largest active stream, flows along the western border of the parish. It brings sediments from the Mississippi and Red Rivers and distributes them over the western marshes. Other large streams that were once active in building up the natural levee ridges - Bayou Black, Little Bayou Black, Bayou Terrebonne, Bayou du Large, Bayou Grand Caillou, and Bayou Petit Caillou - now carry little drainage water except from their narrow watersheds.

Bayou Black, Bayou Terrebonne, and Little Bayou Black enter the parish from the north and northwest. They follow narrow channels between levee ridges southeasterly to Houma. From Houma the streams generally flow to the south and southwest.

Approximately 10 miles south of Houma, most of the stream channels are at sea level. These streams flow slowly or are stagnant. The direction of their flow is determined by the direction of the winds and the height of the tides in this area. During prolonged periods of high tides, the water in the streams and canals is raised and the surface water cannot flow from the land.

In the southern part of the parish, many bayous end in shallow lakes or bays. Most major stream channels can be traced across the marshes and into the bays, the lakes, and the Gulf of Mexico.

[1] Numbers in italics refer to Literature Cited, p. 43.

Numerous small and large lakes, bayous, and segments of bayous occur in the coastal marshes. Many canals have been constructed in the marshes and swamps for use in the exploration and production of oil, gas, and sulfur.

The Intracoastal Waterway crosses the northern part of the parish and intersects the Lower Atchafalaya River. Parts of the waterway are occasionally flooded by the Lower Atchafalaya River, and water is impounded in adjacent land areas.

Climate

Terrebonne Parish has a mild, humid, subtropical climate. Climate data from the United States Weather Bureau Station at Houma are given in table 1.

The summers are long and hot. Fall weather is warm and is often without killing frosts. There are a few cool days. The winters are usually mild and cool, but a few days are cold. Spring weather is mild and warm.

TABLE 1.—*Temperature and precipitation at Houma, Terrebonne Parish, La.*

[Elevation, 13 feet]

Month	Temperature[1]			Precipitation[2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1899)	Wettest year (1942)	Average snowfall
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December	56.8	89	15	4.75	4.38	3.56	(3)
January	56.4	88	14	4.50	1.00	1.32	(3)
February	58.8	87	5	4.01	4.15	8.39	
Winter	57.3	89	5	13.26	9.53	13.27	
March	62.6	90	25	5.44	.26	6.22	(3)
April	68.9	92	28	4.32	2.08	3.46	
May	74.5	99	42	4.41	1.50	5.05	
Spring	68.7	99	25	14.17	3.84	14.73	(3)
June	79.9	104	51	6.32	3.37	15.00	
July	81.3	102	58	7.86	3.17	12.94	
August	81.3	101	56	7.73	5.70	10.19	
Summer	80.8	104	51	21.91	12.24	38.13	(
September	78.4	100	43	6.57	1.39	9.08	(
October	70.5	96	30	4.13	4.86	11.00	(
November	61.0	91	21	4.64	1.17	1.32	(
Fall	70.0	100	21	15.34	7.42	21.40	(
Year	69.2	104	5	64.68	33.03	87.53	.4

[1] Average temperature based on a 66-year record, through 1955; highest temperature on a 63-year record and lowest temperature on a 62-year record, through 1952.

[2] Average precipitation based on a 65-year record, through 1955; wettest and driest years based on a 64-year record, in the period 1889–1955; snowfall based on a 56-year record, through 1952.

[3] Trace.

The latest killing frost in spring occurred on April 10, 1938: the earliest in fall was on October 25, 1903. Terrebonne Parish has a growing season. The average frost-free period of 264 days extends from February 27 to November 18.

Rainfall is well distributed throughout the growing season. The rains are generally heavy showers of short duration, although occasional gentle rains occur that last more than a day. Rains of 3 to 6 inches or more in 24 hours occur annually, but such storms are not frequent. Prolonged dry and wet periods are unusual. Occasionally, the spring seasons are too wet and the fall seasons too dry for planting and cultivation sugarcane.

The weather is usually mild enough in February for planting corn and cultivation sugar cane. Usually, by March, all of the better drained soils have become warm, anc corn planting is completed between the light showers. In April and May, the finer textured soils that have adequate drainage are planted to corn and the sugarcane is cultivated. By late May, some of the sugarcane and corn can be given a final cultivation.

'he heaviest rainfall occurs in summer, but usually not ore that 2 or 3 inches fall during a 48-hour period. 'he weather is generally somewhat dry in the fall, but here is usually enough moisture for planting sugarcane 'or the next year's crop. The sugarcane harvest starts bout the middle of October and is usually completed by anuary 1.

southerly or southeasterly breeze from the Gulf of exico alleviated the discomfort of the usual high umidity and high temperatures in summer and early in ll. The evenings, nights, and mornings are usually ol throughout the year. Hurricanes occur once or ice in every 3 to 7 years. The destructive winds ing in the waters of the gulf and spread them over rge areas of the marshes and lower lying natural vee ridges to depths of 10 feet. The normal daily des inundate the lower coastal marshes to depths of to 18 inches.

ıter Supply

ere is an abundant supply of water suitable for live- ck in the farming areas. In the northern part of parish fresh water is obtained from wells 150 to feet deep. The supply is limited and may be con- inated by salt water, especially during droughts.

supply of water suitable for public use is obtained Houma from Bayou Black and the Intracoastal Water- . At the present time, no appreciable amount of face water is carried by Bayou Black and other ller streams. During extremely dry seasons and oc- ionally after storms, salt water enters the Intra- coastal Waterway and makes the water too salty drinking. The surface water is pumped into a reser at Houma a s made suitable for drinking at cons able expense. this water system has been enlarged. a pipeline now carries water from Houma to rural a in the parish. Most families in rural areas form caught rainwater and stored it in cisterns.

Vegetation

Grasses, rushes, sedges, and herbs are the domi plants in Terrebonne Parish. These plants g luxuriantly in the coastal marshes. Small fores areas are on the higher natural levee ridges and, most places, on the subsided areas along the borders the ridges.

The vegetation of the coastal marsh is affected by salinity of the soil and water. Near the coastline, the areas frequently inundated by salty tidewater or occasional high tides during storms, the dominant ve tation has a salt tolerance of 2 percent or mo Major plants of the salt-water marshes are oystergr (*Spartina alterniflora*), black rush (*Junc roemerianus*), and black-mangrove (*Avicennia nitida*).

The landward area, or innermost part of the coast marsh, is often flooded by fresh water from the swam and ridges. this area has a dense growth of fres water or nearly fresh-water plants, tolerant to le than 0.5 percent salt. The dominant plants in t fresh-water marshes are paille fine (*Panic hemitomon*), cattail (*typha latifolia*), delta pota (*Sagittaria lancifolia*), and cutgrass (*Zizaniops miliacea*).

Between the areas of salt-water marsh and fresh-wat marsh, a broad belt of soils supports plants that ar tolerant to brackish water (0.5 to 2 percent salt) The dominant plants of these brackish marshes ar couchgrass (*Spartina patens*), big cordgrass (*S. cync suroides*), and three-cornergrass (*Scirpus olneyi*).

The trees on the higher and better drained soils of th ridges include sweetgum, magnolia, hackberry, mulberry water oak, and live oak.

Low areas of forest and swamps occur in many places be- tween the fresh-water marsh and the natural leve ridges. These areas are often flooded, and water covers the surface much of the time. The forest trees of these swamps are cypress, tupelo-gum, swamp maple, and ash.

Volunteer grasses on the natural levee ridges are bermudagrass, dallisgrass, johnsongrass, bluestem.

Sharkey series

The Sharkey series consists of dark-colored soils of the bottom lands. They are developing in slightly acid to moderately alkaline clay sediments carried b the distributary streams of the several delta systems of the Mississippi River. These fine-textured sediments were deposited in depressions, such as shallow lakes and embayments, along the borders of the natural levee ridges. These sites support a luxuriant growth of moisture-tolerant trees and an undergrowth of marsh plants. The soils are dark colored and contain moderate amounts of organic matter as a result of repeated deposits of clays and organic residues.

Sharkey soils occur in large flat areas in the eastern, northeastern, northern, and southeastern parts of the parish. Elevations range from 2 to 7 feet above the gulf. Natural drainage is poor. Runoff and internal drainage are slow to very slow. On the drier areas at elevations of 4 feet or more, the water table is commonly 16 to 24 inches below the surface. Areas that are 3 feet or less above the level of the gulf are often flooded. In these areas the water table is 6 to 14 inches below the surface during long dry seasons or periodic low tides. The height of water in or over the Sharkey soils in low areas generally depends on the depth of water in the neighboring swamps.

Sharkey soils occur in lower sites than the associated better drained Mhoon soils. Other differences are that the Mhoon soils have dark grayish brown instead of very dark gray surface soils and are made up of stratified layers of silt loam, silty clay loam, and silty clay instead of thick beds of clay. Sharkey soils are darker, better drained, and slightly higher than the associated Swamp, clays and mucky clays.

The surface layer of the Sharkey soil is clay or silty clay in texture, very dark gray, black, or dark brown in color, and slightly acid to neutral in reaction. It ranges from 4 to 12 inches in thickness. The mottled dark-brown and gray plastic clay substratum is 16 to 28 inches below the soil surface and is neutral to mildly alkaline. The upper substratum layer is underlain by gray or gray mottled brown, neutral to alkaline plastic clay.

Sharkey clay, shallow phase, has a clay surface layer underlain by stratified medium- and fine-textured sediments at depths below 18 to 24 inches. Areas of this soil are included with Mhoon-Sharkey clays and Mhoon-Sharkey clays, low phases.

Sharkey soils are very fertile. They produce good crop yields when moisture is favorable for plant growth and for planting, cultivating, and harvesting. Intensive artificial drainage is needed to produce profitable yields of row crops and good pasture. Protection from overflow and pump drainage are necessary if low r are used for row crops.

Tilth is generally poor, and the soils are difficul work when wet or dry. Sharkey soils generally cor enough moisture for crops and frequently have too m

The forest cover of the Sharkey soils is cypress, w tupelo or tupelo-gum, red or swamp maple, ash, swamp bay (*Persea palustris*).

Sharkey clay (Sd) - This poorly drained soil oc along the lower borders of the natural levee ridge the northern and northeastern parts of the par Areas are flat and undulating and are 2 to 7 feet a the level of the gulf. Runoff and internal drai are slow to very slow.

Sharkey clay contains moderate to high amounts of p phorus, potassium, calcium, and magnesium and mode amounts of organic matter. Tilth is generally p and the soil is hard to work because it is usu either too wet or too dry. Artificial drainage needed on all areas used for row crops. Pasture hay crops are more productive on properly dra areas. Both drainage and irrigation structures required if this soil is planted to rice.

The surface soil is a dark-gray to dark-brown, slig acid to mildly alkaline, plastic clay that is 6 t inches thick. The lower 4 or 5 inches of the sur soil commonly is a compacted or puddled layer that a platy structure. This layer has been compacte heavy farm machinery.

The substratum layer to depths of 16 to 24 inches mottled gray and brown strong blocky clay, neutra moderately alkaline in reaction. This layer is un lain by gray or gray mottled brown, massive, plas neutral to alkaline clay to depths of 48 inches more.

Representative profile:

- 0 to 3 inches, very dark gray plastic clay; strong fine granular structure; slightly acid.
- 3 to 8 inches, very dark gray plastic clay; moderate to strong f granular structure; slightly acid.
- 8 to 16 inches, very dark gray plastic clay; mottled yellowish b moderate medium and fine blocky and moderate coarse platy structure; neutral.
- 16 to 20 inches, very dark gray plastic clay; mottled dark brown strong medium and fine blocky structure; moderately alkaline.
- 20 to 42 inches, gray plastic clay; mottled yellowish brown; mod to strong medium and fine blocky structure; moderately alkalin

The gray mottlings occurring at depths of 16 to inches below the surface indicate the usual height the water table.

Use and management - This soil is in management group IIIw-2. Most areas are artificially drained and used for row crops, pasture, and rice. If used for tilled crops, the rows are constructed with the fall of the land and the middle of each row serves as a drainage ditch. Closely spaced open ditches along the sides of the cuts or small field plots help to drain these areas and to divert the runoff from higher soils. Quarter drains are used to planted on Sharkey clay, structure for gravity drainage, contour levees, and supply systems for irrigation water are necessary.

If properly drained, this soil is well suited to sugarcane, corn, and soybeans. It does not produce row crops so well as the better drained Commerce and Mhoon soils. Sharkey clay is very well suited to irrigated rice and pasture. Nitrogen is commonly the only fertilizer used on sugarcane. Nitrogen and complete fertilizer mixtures are used on some corn and rice crops.

Legume crops turned under for green manure and pasture in the rotation improve soil drainage, tilth, aeration, and structure and make this soil more desirable for row crops.

Sharkey clay, low phase (Se) - This soil occurs at 2 to 4 feet above the level of the gulf. It is frequently flooded by runoff from higher soils, by tides, and by water from catch basins in the swamps. Sharkey clay, low phase, has a higher water table and more restricted drainage and is more likely to be flooded than Sharkey clay. It differs from Swamp, clays and mucky clays, in having thicker dark-colored surface and substrata layers, and in having a better surface soil and substratum structure.

This is a fertile soil that contains moderate to large amounts of phosphorus, potassium, calcium, magnesium, and organic matter.

Representative profile:

- 0 to 3 inches, very dark gray plastic clay; strong find granular structure; neutral.
- 3 to 5 inches, very dark gray plastic clay; strong coarse platy and moderate fine blocky structure; neutral.
- 5 to 12 inches, dark-gray plastic clay mottled with yellowish brown and dark brown; strong coarse platy and weak coarse blocky structure; neutral.
- 12 to 18 inches, gray plastic clay mottled with yellowish brown and dark brown; weak coarse blocky structure; neutral.
- 18 to 42 inches, gray plastic clay; 10 to 40 percent mottled yellowish brown; weak coarse blocky structure; mildly alkaline.

The surface soil ranges from very dark gray to black in color and from slightly acid to mildly alkaline in reaction. The substratum is neutral to moderately alkaline. The dominant gray color indicates the height of a recent water table, which was 6 to 12 inches below the soil surface.

Use and management - This soil is in management Vw-1. Most areas are in forest, although some areas are used for pasture and cultivated crops. yields are generally low. Artificial drainag flood protection are necessary before row crops successfully grown. If protected from floods by and drained by pumping, large areas of this soil northern and northeastern parts of the parish c used for row crops, pasture, and rice.

It is not practical at this time to reclaim the areas that occur in the eastern and southeastern of the parish. These areas are affected by high during storms.

Shell beaches

Shell beaches consist of shells and shell fra from the floor of the Gulf of Mexico that have be posited along parts of the coastline. The continuous area extends along the Gulf of Mexico Jack Stout Bay westward to include Point Au Several small shell beaches occur on islands i southern and southeastern parts of the coastline.

Shell beaches (Sf) - shell beaches are 2 to 6 above the level of the gulf and are 0.02 to 0.05 wide. they are 2 to 3 feet higher than the assoc alluvial clays and mucky clays.

The shells are piled up on the southwestern southern sides of the islands. Shell beaches are up mainly of oystershells and fragments of oy shells.

Use and management - shell beaches are barren. are in management group VIII-3.

Swamp soils

Swamp soils occur in frequently flooded forest are the back swamps which border the natural levee r in the northern, northwestern, and northeaster par the parish. These soils include clay and silty sediments deposited primarily by the Mississippi R They commonly occur on the landward border of fresh-water marsh and are not generally affect brackish and salty tidewaters. They are slightly than the associated sharkey soils and slightly h than the marshes. Small areas of swamp occur bayous in the eastern and western parts of the par

Organic materials that vary in thickness and degr decomposition are on the surface of large area swamp soils. These materials are debris left by generations of swamp trees and marsh plants. soils in which the organic matter is so decomposed

pa

classified as Swamp, muck. The swamp mucks contain various amounts of mineral soil materials.

Some organic residues have accumulated in the swamps in sites where air was excluded and oxidation and decay were limited. These organic materials are only slightly decomposed, and the resulting material is classified as Swamp, peat, and Swamp, deep peat.

wamp soils occur on areas that range in elevation from ear-gulf level to 5 feet. In large areas of the wamp, water stands at the surface or 1 or 2 feet above t most of the time.

wamp soils are poorly drained, subject to frequent verflow, and unsuitable for cultivated crops.

he present forest growth includes tupelo-gum, cypress, vamp maple, bay, and ash. Frequently, there is an un- ergrowth of marsh plants, including paille fine, delta otato, cutgrass, cattail, and common lizardtail *aururus cernuus*).

amp, clays and mucky clays (Sg) - This mapping unit poorly drained and medium to slightly acid. It con- sts of fine-textured alluvium from the Mississippi ver. It occurs in level and depressed areas along borders of the natural levee ridges at elevations at range from 2.5 to 4 feet above the gulf. It is en flooded by runoff, particularly when natural ainage is restricted by tidewater over neighboring shlands. Water is frequently impounded on some as by high tides. Swamp, clays and mucky clays, is ghtly lower than the associated Sharkey soils and to 2 feet higher than the associated marsh soils the other swamp soils.

resentative profile:

0 to 4 inches, black mucky clay; slightly plastic when wet, moderate medium granular when dry; contains 15 percent of fine fibrous plant remains; slightly acid.

4 to 12 inches, dark-gray, massive, plastic clay; contains 5 percent of fine fibrous plant remains; slightly acid.

12 to 30 inches, gray, massive, plastic clay; dark reddish-brown oxidized material around root channels; fine- and medium-sized roots are common; mildly alkaline.

30 to 42 inches, gray, massive, plastic clay; contains a few distinct mottles of yellowish brown; moderately alkaline.

surface layer is gray or black in color and mucky or clay in texture. It ranges from 6 to 10 inches hickness. In many places a 2- to 5-inch surface of muck or mucky peat overlies the mucky clay. clay substratum is gray or very dark gray. The ace layer ranges from medium acid to neutral, and substratum from neutral to moderately alkaline. areas contain moderately low amounts of organic nutrients.

Use and management - This soil is in management gro Vw-1. Most of it is in forest; small areas are in vo unteer grass pasture. Forest production can be i creased by proper management. Small areas may cleared and used for pasture.

Swamp, muck (Sh) - This mapping unit consists of swamp forested areas that have a moderately thin (14 to inches) muck surface layer. It is underlain by gr clay and silty clay alluvium, mainly of Mississipp River origin.

Swamp, muck, occurs along the landward border of th marshes, well removed from brackish and salt-wate tides. It is in the northern, northwestern, eastern and southeastern parts of the parish, mostly along th back-swamp borders of natural levee ridges. It is fre quently flooded by runoff from the ridges. Elevations range from 2 to 4 feet.

This soil type is closely associated with the lower Fresh water marsh, peat, and the slightly higher Swamp, clays and mucky clays. Swamp, muck, commonly borders the depression areas of Swamp, peat. Large areas are often covered with 1 or 2 feet of water.

A dense to thin stand of tupelo-gum, cypress, swamp maple, ash, and bay trees grows on Swamp, muck. Most of the marketable timber has been harvested, and the present trees are generally small.

Representative profile:

0 to 18 inches, black friable muck; contains 10 to 15 percent of coarse and fine fibrous peat; strong fine granular structure; slightly acid.

18 to 42 inches, gray plastic clay; 10 percent mottled with yellowish brown; massive structure; neutral.

The surface layer is muck or peaty muck. It ranges from dark reddish brown to black in color and from medium acid to neutral in reaction. The clay substratum is gray or dark gray. Thin and thick lenses of muck and mucky peat occur in a few areas at depths of 5 to 11 feet.

Use and management - Swamp, muck, is in management group Vw-1. It is low and often flooded and is there- fore not suited to cultivated crops or pasture. Some areas provide limited grazing and forage during dry seasons.

Small areas on the higher elevations have been drained, in part, by large ditches of the parishwide drainage

REFERENCE 19

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Water in Environmental Planning

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WATER
in Environmental Planning

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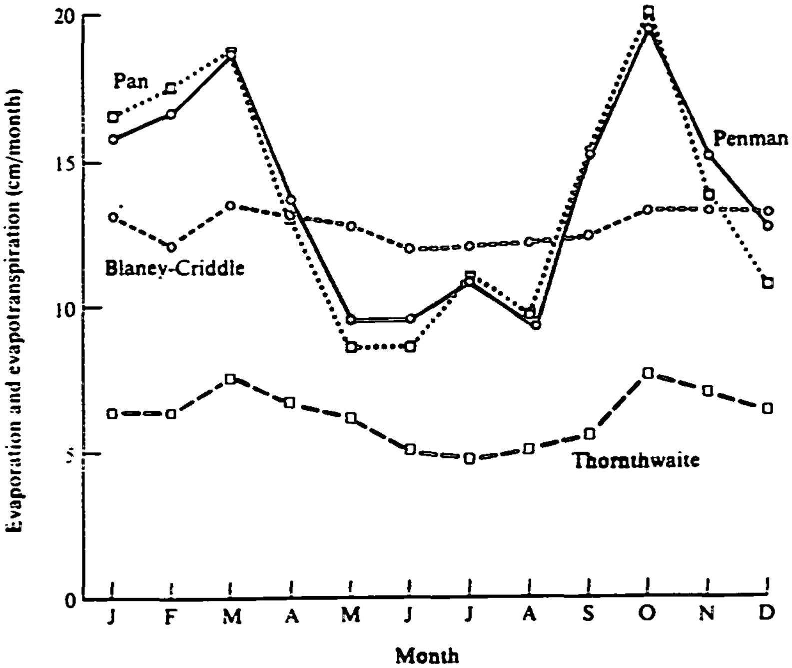

Figure 5-3 Measured pan evaporation and calculated potential evapotranspiration at Muguga, Kenya, for 1963. The curve marked "Pan" is measured evaporation. The other three curves are computed values of evapotranspiration using different methods. (After Dagg and Blackie 1970.)

1972). The methods based upon air temperature work best in the regions for which they were developed, namely, midlatitude continental climates, where air temperature is a fairly good index of net radiation. In the tropics, however, these methods often give erroneous results, and may seriously underestimate the amplitude of seasonal fluctuations of water demand (see Figure 5-3). In such areas it is preferable to use the energy-balance approach even if radiation must be estimated. In the tropical world, even data on wind and vapor pressure are relatively rare, but this problem is reduced by the fact that in the tropics the radiation term in the Penman Equation is usually dominant. The temperature methods are still in use, however, and planners concerned with rural areas should be familiar with them.

The Thornthwaite Method

The Thornthwaite method uses air temperature as an index of the energy available for evapotranspiration, assuming that air temperature is correlated with the integrated effects of net radiation and other controls of evapotranspiration, and that the available energy is shared in fixed pro-

portion between heating the atmosphere and evapotranspiration. There is no correction for different vegetation types. The empirical formula Thornthwaite developed is

$$E_t = 1.6\left[\frac{10T_a}{I}\right]^a \tag{5-8}$$

where E_t = potential evapotranspiration in cm/mo

T_a = mean monthly air temperature (°C)

$$I = \text{annual heat index} = \sum_{i=1}^{12}\left[\frac{T_{ai}}{5}\right]^{1.5} \tag{5-9}$$

$$a = 0.49 + 0.0179I - 0.0000771I^2 + 0.000000675I^3. \tag{5-10}$$

Figure 5-4 can be used for the evaluation of Thornthwaite's E_t value, as described in the caption. The annual heat index, I, can be estimated directly from Figure 5-5, at least for stations in the United States. The relationship

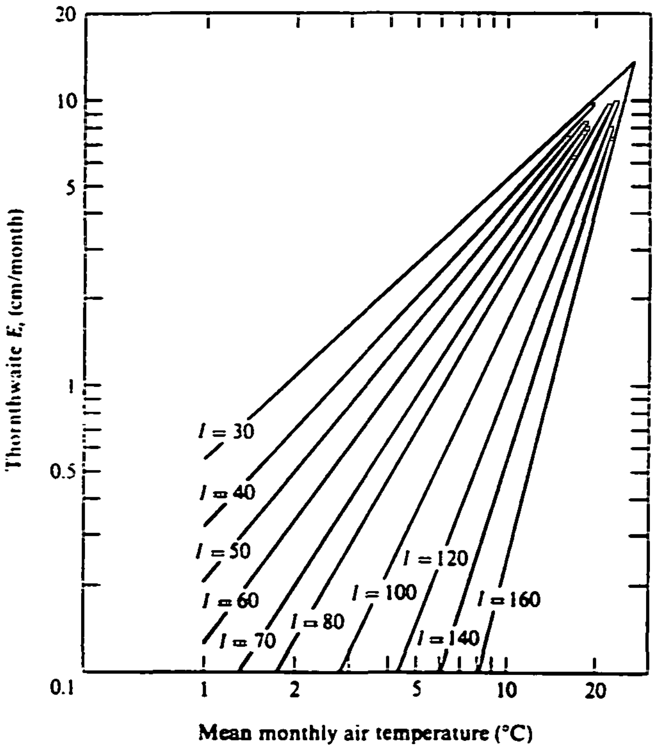

Figure 5-4 Graphical solution of the Thornthwaite formula for potential evapotranspiration, E_t, as a function of mean monthly air temperature for various values of annual heat index, I. The relation of the heat index I to mean annual temperature is shown in Figure 5-5.

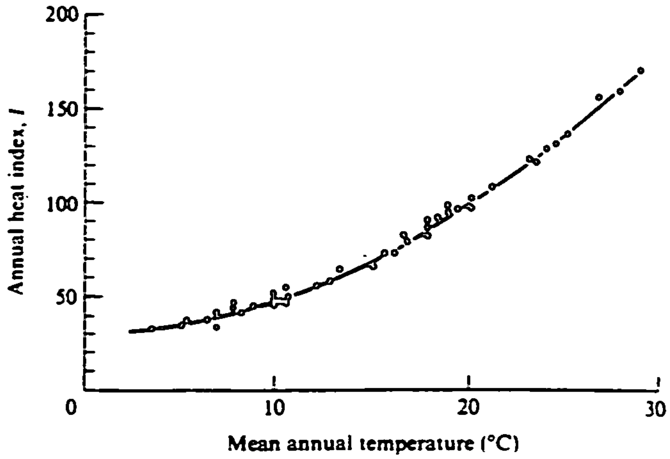

Figure 5-5 Annual heat index I of the Thornthwaite Equation as a function of mean annual temperature. (From Palmer and Havens 1958.)

should be checked before being used elsewhere. Daily or monthly potential evapotranspiration computed in Equation 5-8 or obtained from Figure 5-4 is for a standard month of 360 hours of daylight. It must be adjusted for the number of days per month and the length of day (a function of latitude). The standard potential evapotranspiration from Figure 5-4 should be multiplied by the appropriate factor given in Table 5-2 to make the adjustment for month and latitude.

Table 5-2 Correction factor for monthly sunshine duration for multiplication of the standard potential evapotranspiration from Figure 5-4.

LATITUDE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
60°N	0.54	0.67	0.97	1.19	1.33	1.56	1.55	1.33	1.07	0.84	0.58	0.48
50°N	0.71	0.84	0.98	1.14	1.28	1.36	1.33	1.21	1.06	0.90	0.76	0.68
40°N	0.80	0.89	0.99	1.10	1.20	1.25	1.23	1.15	1.04	0.93	0.83	0.78
30°N	0.87	0.93	1.00	1.07	1.14	1.17	1.16	1.11	1.03	0.96	0.89	0.85
20°N	0.92	0.96	1.00	1.05	1.09	1.11	1.10	1.07	1.02	0.98	0.93	0.91
10°N	0.97	0.98	1.00	1.03	1.05	1.06	1.05	1.04	1.02	0.99	0.97	0.96
0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10°S	1.05	1.04	1.02	0.99	0.97	0.96	0.97	0.98	1.00	1.03	1.05	1.06
20°S	1.10	1.07	1.02	0.98	0.93	0.91	0.92	0.96	1.00	1.05	1.09	1.11
30°S	1.16	1.11	1.03	0.96	0.89	0.85	0.87	0.93	1.00	1.07	1.14	1.17
40°S	1.23	1.15	1.04	0.93	0.83	0.78	0.80	0.89	0.99	1.10	1.20	1.25
50°S	1.33	1.19	1.05	0.89	0.75	0.68	0.70	0.82	0.97	1.13	1.27	1.36

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Delta Shipyard (CERCLIS ID LAD058475419)
Net Annual Precipitation Calculation

Month	Precipitation (inches)	Temperature (degrees F)	Factor	Evaporation (inches)	Net Precipitation (inches)
Jan	4.50	56.4	0.87	1.02	3.48
Feb	4.01	58.8	0.93	1.34	2.67
Mar	5.44	62.6	1.00	1.94	3.50
Apr	4.32	68.9	1.07	3.17	1.15
May	4.41	74.5	1.14	4.64	0.00
Jun	6.32	79.9	1.17	6.24	0.08
Jul	7.86	81.3	1.16	6.61	1.25
Aug	7.73	81.3	1.11	6.33	1.40
Sep	6.57	78.4	1.03	5.12	1.45
Oct	4.13	70.5	0.96	3.14	0.99
Nov	4.64	61.0	0.89	1.53	3.11
Dec	4.75	56.8	0.85	1.03	3.72

Annual Net Precipitation ***22.80 inches***

$$a = 6.75e\text{-}7\, I^3 - 7.71e\text{-}5\, I^2 + 1.79e\text{-}2\, I + 0.49$$

$$I = \sum_{i=1}^{12} (T_i/5)^{1.5}$$

$$E_i = 1.6F_i(10T_i \ / \ I)^a$$

E_i = Monthly potential evapotranspiration in inches for month i.
F_i = Monthly latitude adjusting value for month i.
T_i = Mean monthly temperature in degrees Celsius for month i.

Source: Dunne, T. and Leopold, L.B. 1978. Water in Environmental Planning. W.H. Freeman and Company, New York.

REFERENCE 21

~~88573~~

March 12, 1996
To: Joy Ishigo
From: Bryan Sampey
Re: Waterflow data, Intracoastal and Navigational Canals, Bayou Lacarpe.

Please find below, some general information pertaining to the tidal waterflow in the area around Houma Waterplant No. 3.

During periods of salt intrusion, Bayou Black Reservoir is the back up water source for waterplant no. 3.

With sustained southeast winds, or prior to a hurricane, salt from the Navigational Canal can intrude into the Intracoastal Canal toward the west, then into Minors Canal.
For this reason, to prevent contamination of Bayou Black, a salt intrusion barrier gate is located on Minors Canal.

The Bayou Black Reservoir is filled and/or freshened with the use of two of three pumps, located at the Waterproof Pump Station. Water from Bayou Black is pumped over a dam, at the pump station, and flows over a second dam/wier, located by the Bayou Black Pump Station. Water flowing over the dam/wier, runs into the Houma Canal, then into the Intracoastal Canal.

The Bayou Black Pump Station is used to pump water from the Bayou Black Reservoir into the plant reservoir.

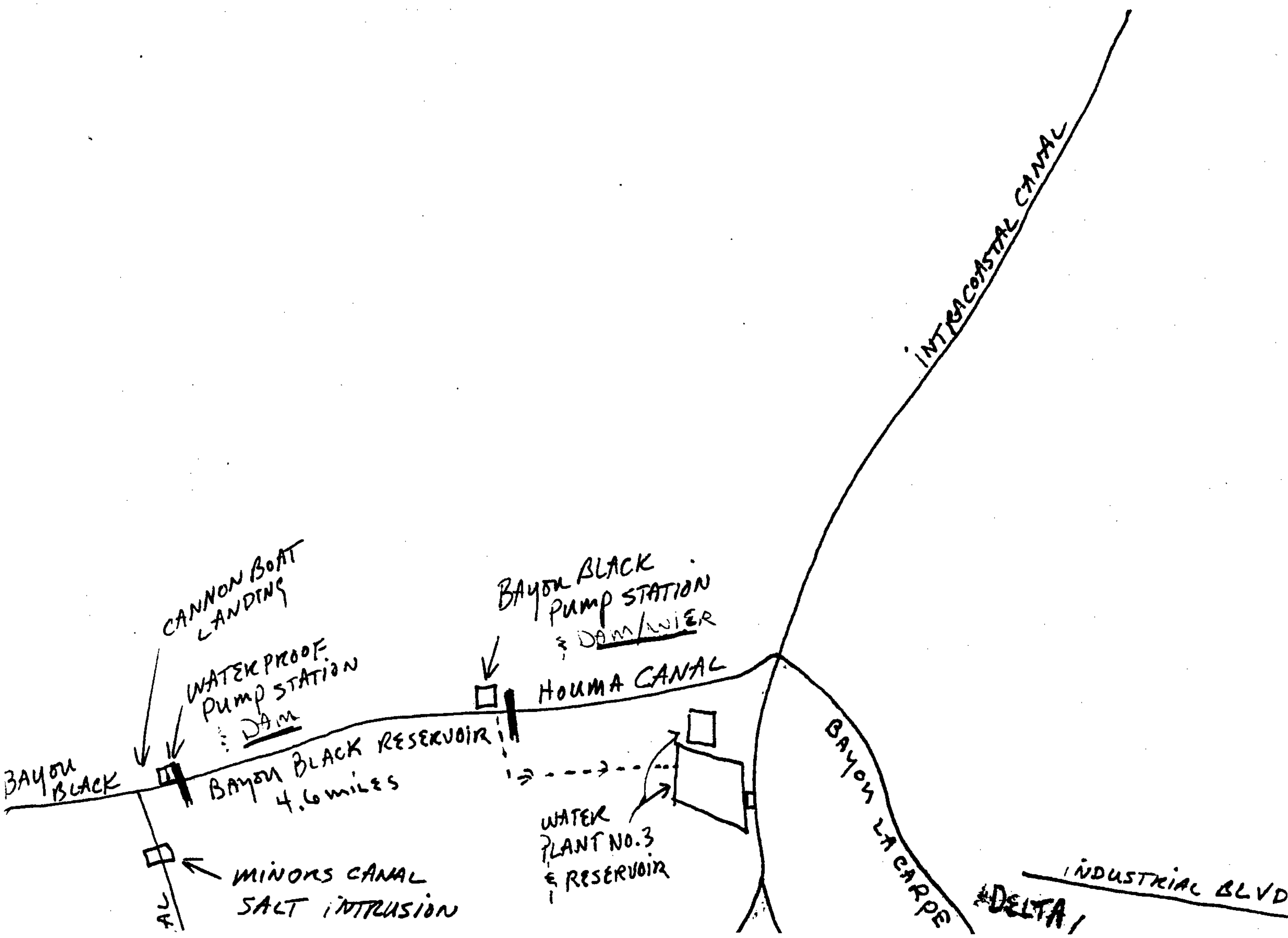
Boaters and fishermen launch at Cannon's Boat Landing, and use Minor Canal to access lakes: Hatch, Theriot, and DeCade.

Houma Waterplant No. 3 is located next to the Intracoastal Canal, .3 of a mile north of the intersection of the Intracoastal Canal and the Navigational Canal.

When the tide comes inward in a northerly directrion, water from the Navigational Canal can also enter into the Intracoastal Canal via Bayou LaCarpe, north of the waterplant.
This water from Bayou LaCarpe could possibly pass by the waterplant intakes once the tide shifts to the south.

If you need additional information, call me at 504-857-9633.

Bryan Sampey


INTRACOASTAL CANAL
CANNON BOAT LANDING
WATERPROOF PUMP STATION & DAM
BAYOU BLACK PUMP STATION & DAM/WIER
HOUMA CANAL
BAYOU BLACK
BAYOU BLACK RESERVOIR
BAYOU BLACK RESERVOIR 4.6 MILES
MINORS CANAL SALT INTRUSION
WATER PLANT NO. 3 & RESERVOIR
BAYOU LACARPE
INDUSTRIAL BLVD
DELTA

REFERENCE 22

~~88575~~

BOURG, LA.

BOURG, LA.

NEW ORLEANS NE

NEW ORLEANS

BOURG, LA.

SCALE 1:24 000

1 MILE · 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET · 1 KILOMETER

1 acre · 10 acres · 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

UPLAND LEGEND

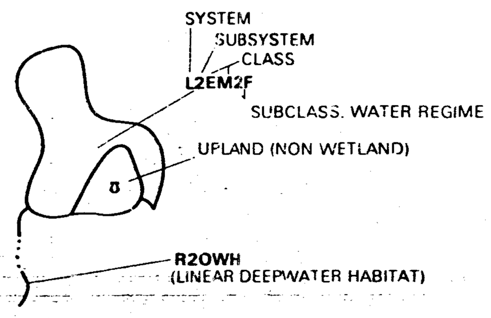
UPLAND CLASSES	MODIFYING TERMS
U-Urban or Developed	o-oil and/or gas
A-Agricultural	r-rice field
F-Forest	6-deciduous 7-evergreen 8-mixed
SS-Scrub-Shrub	p-park
R-Range	s-spoil d-dune
B-Barren	t-transportation

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS - 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

SYMBOLOGY EXAMPLE



Ʊ — Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *Italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

AERIAL PHOTOGRAPHY

DATE:	11 / 88	1 / 89
SCALE:	1:65 000	1:65 000
TYPE:	CIR	CIR

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
1992
Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

M — MARINE

SUBSYSTEM: 1 — SUBTIDAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
RF — REEF	1 Coral, 3 Worm
OW — *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 2 — INTERTIDAL

CLASS	Subclass
AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
RF — REEF	1 Coral, 3 Worm
RS — ROCKY SHORE	1 Bedrock, 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

E — ESTUARINE

SUBSYSTEM: 1 — SUBTIDAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
RF — REEF	2 Mollusc, 3 Worm
OW — *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 2 — INTERTIDAL

CLASS	Subclass
AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
RF — REEF	2 Mollusc, 3 Worm
SB — STREAMBED	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
RS — ROCKY SHORE	1 Bedrock, 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
EM — EMERGENT	1 Persistent, 2 Nonpersistent
SS — SCRUB-SHRUB	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
FO — FORESTED	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

R — RIVERINE

SUBSYSTEM: 1 — TIDAL · 2 — LOWER PERENNIAL · 3 — UPPER PERENNIAL · 4 — INTERMITTENT · 5 — UNKNOWN PERENNIAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
*SB — STREAMBED	1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated
AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
RS — ROCKY SHORE	1 Bedrock, 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
**EM — EMERGENT	2 Nonpersistent
OW — *OPEN WATER/ Unknown Bottom*	

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.

**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

L — LACUSTRINE

SUBSYSTEM: 1 — LIMNETIC

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
OW — *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 2 — LITTORAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
RS — ROCKY SHORE	1 Bedrock, 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
EM — EMERGENT	2 Nonpersistent
OW — *OPEN WATER/ Unknown Bottom*	

P — PALUSTRINE

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
ML — MOSS-LICHEN	1 Moss, 2 Lichen
EM — EMERGENT	1 Persistent, 2 Nonpersistent
SS — SCRUB-SHRUB	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
FO — FORESTED	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
OW — *OPEN WATER/ Unknown Bottom*	

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal:
- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal:
- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity: 1 Hyperhaline, 2 Euhaline, 3 Mixohaline (Brackish), 4 Polyhaline, 5 Mesohaline, 6 Oligohaline, 0 Fresh

Inland Salinity: 7 Hypersaline, 8 Eusaline, 9 Mixosaline, 0 Fresh

pH Modifiers for all Fresh Water: a Acid, t Circumneutral, i Alkaline

SOIL

g Organic, n Mineral

SPECIAL MODIFIERS

b *Beaver*, d *Partially Drained/Ditched*, f Farmed, h *Diked/Impounded*, r Artificial Substrate, s *Spoil*, x Excavated

REFERENCE 23

~~88589~~

U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges, Secretary

WEATHER BUREAU
F. W. Reichelderfer, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

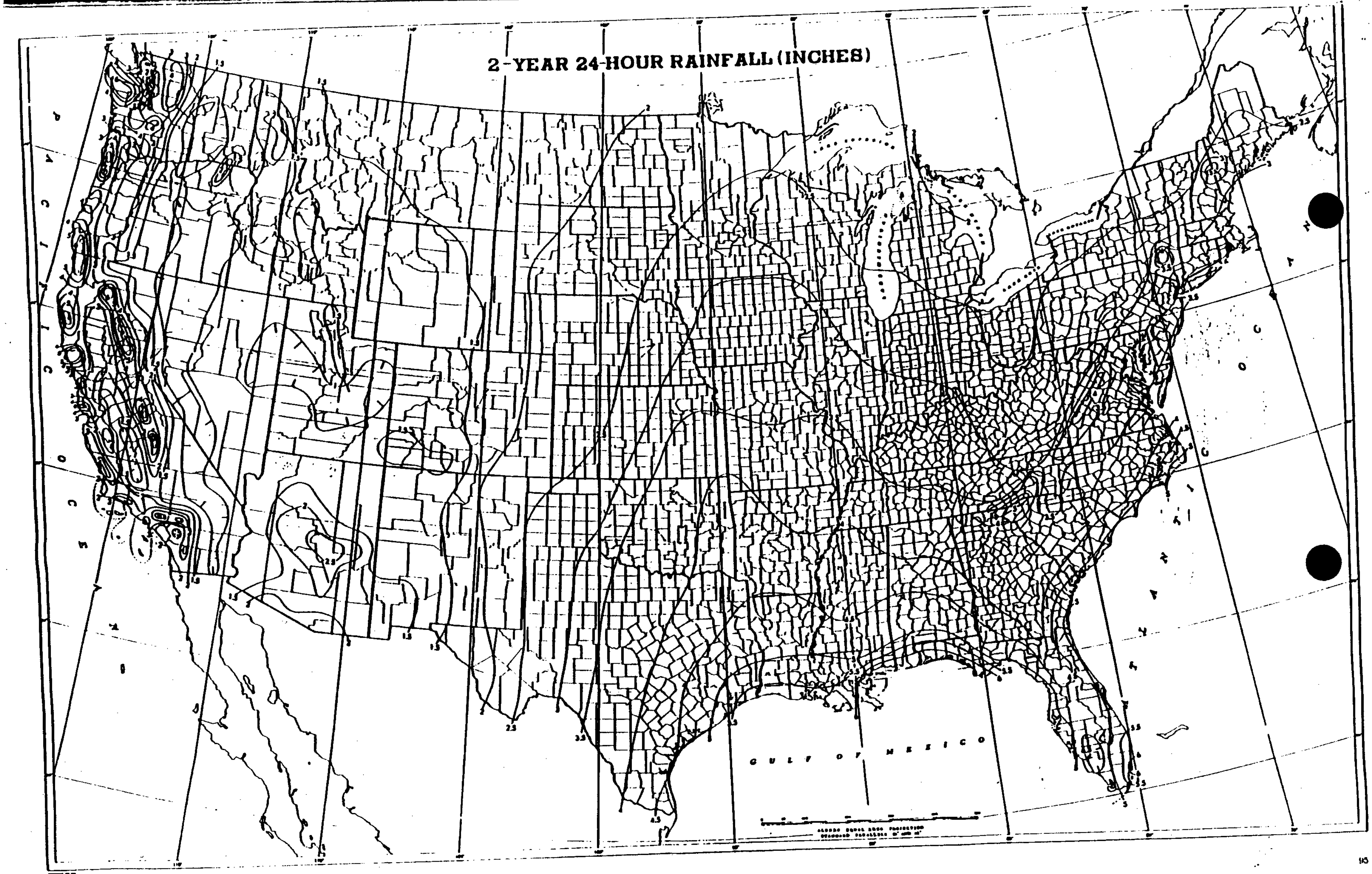
PREFACE

This publication is intended as a convenient summary of empirical relationships, working guides, and maps, useful in practical problems requiring rainfall frequency data. It is an outgrowth of several previous Weather Bureau publications on this subject prepared under the direction of the author and contains an expansion and generalization of the ideas and results in earlier papers. This work has been supported and financed by the Soil Conservation Service, Department of Agriculture, to provide material for use in developing planning and design criteria for the Watershed Protection and Flood Prevention program (P L. 566, 83d Congress and as amended).

The paper is divided into two parts. The first part presents the rainfall analyses. Included are measures of the quality of the various relationships, comparisons with previous works of a similar nature, numerical examples, discussions of the limitations of the results, transformation from point to areal frequency, and seasonal variation. The second part presents 49 rainfall frequency maps based on a comprehensive and integrated collection of up-to-date statistics, several related maps, and seasonal variation diagrams. The rainfall frequency (isopluvial) maps are for selected durations from 30 minutes to 24 hours and return periods from 1 to 100 years.

This study was prepared in the Cooperative Studies Section (Joseph L. H. Paulhus, Chief) of Hydrologic Services Division (William E Hiatt, Chief) Coordination with the Soil Conservation Service, Department of Agriculture, was maintained through Harold O. Ogrosky, Chief, Hydrology Branch, Engineering Division. Assistance in the study was received from several people In particular, the author wishes to acknowledge the help of William E. Miller who programmed the frequency and duration functions and supervised the processing of all the data; Normalee S. Foat who supervised the collection of the basic data; Howard Thompson who prepared the maps for analysis; Walter T. Wilson, a former colleague, who was associated with the development of a large portion of the material presented here; Max A. Kohler, A. L. Shands, and Leonard L. Weiss, of the Weather Bureau, and V. Mockus and R. G. Andrews, of the Soil Conservation Service, who reviewed the manuscript and made many helpful suggestions. Caroll W. Gardner performed the drafting

CONTENTS


2-YEAR 24-HOUR RAINFALL (INCHES)
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO

REFERENCE 24

~~88593~~

DRINKING WATER REGULATIONS

AND HEALTH ADVISORIES

by

Office of Water
U.S. Environmental Protection Agency
Washington, D.C.

February 1996

These regulations and health advisory tables are revised every 6 months by EPA's Office of Water. Although no permanent mailing list is kept, copies may be ordered free of charge from the:

SAFE DRINKING WATER HOTLINE
1-800-426-4791
Monday thru Friday, 9:00 AM to 5:30 PM EST.

Copies of the supportive technical documentation for the health advisories can be obtained for a fee from the:

Educational Resource Information Center (ERIC)
1929 Kenny Road
Columbus, OH 43210-1080
Telephone number (614) 292-6717
FAX (614) 292-0263
e-mail ERICSE@osu.edu
Payment by Purchase Order/check/Visa or Mastercard.

The Health Advisories available and their ERIC order numbers are included at the end of this publication. For further information regarding the Drinking Water Regulations and Health Advisories, call Barbara Corcoran in EPA's Office of Water at (202) 260-1332.

LEGEND

Abbreviations column descriptions are:

MCLG	-	Maximum Contaminant Level Goal. A non-enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety.
MCL	-	Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to any user of a public water system.
RfD	-	Reference Dose. An estimate of a daily exposure to the human population that is likely to be without appreciable risk of deleterious effects over a lifetime.
DWEL	-	Drinking Water Equivalent Level. A lifetime exposure concentration protective of adverse, non-cancer health effects, that assumes all of the exposure to a contaminant is from a drinking water source.

(*) The codes for the **Status Reg** and **Status HA** columns are as follows:

F	-	final
D	-	draft
L	-	listed for regulation
P	-	proposed
T	-	tentative *(not officially proposed)*

Other codes found in the table include the following:

NA	-	not applicable
PS	-	performance standard 0.5 NTU - 1.0 NTU
TT	-	treatment technique
**	-	No more than 5% of the samples per month may be positive. For systems collecting fewer than 40 samples/month, no more than 1 sample per month may be positive.
***	-	guidance

- Large discrepancies between Lifetime and Longer-term HA values may occur because of the Agency's conservative policies, especially with regard to carcinogenicity, relative source contribution, and less-than-lifetime exposures in chronic toxicity testing. These factors can result in a cumulative UF (uncertainty factor) of up to 5 to 5000 when calculating a Lifetime HA.

The scheme for categorizing chemicals according to their carcinogenic potential is as follows: *

Group A: Human carcinogen

Sufficient evidence in epidemiologic studies to support causal association between exposure and cancer

Group B: Probable human carcinogen

Limited evidence in epidemiologic studies (Group B1) *and/or* sufficient evidence from animal studies (Group B2)

Group C: Possible human carcinogen

Limited evidence from animal studies and inadequate or no data in humans

Group D: Not classifiable

Inadequate or no human and animal evidence of carcinogenicity

Group E: No evidence of carcinogenicity for humans

No evidence of carcinogenicity in at least two adequate animal tests in different species *or* in adequate epidemiologic and animal studies

Drinking Water Health Advisories (HAs) are defined as follows:

One-day HA

The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to 5 consecutive days of exposure, with a margin of safety.

Ten-day HA

The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects up to 14 consecutive days of exposure, with a margin of safety.

Long-term HA

The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects up to approximately 7 years (10% of an individual's lifetime) of exposure, with a margin of safety.

*EPA is in the process of revising the Cancer Guidelines.

Lifetime HA

The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects over a lifetime of exposure, with a margin of safety.

Drinking Water Standards and Health Advisories

Chemicals	Standards				Health Advisories									Cancer Group
					10-kg Child			70-kg Adult						
	Status Reg.	MCLG (mg/l)	MCL (mg/l)	Status HA	One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk		
ORGANICS														
Acenaphthene	-	-	-	-	-	-	-	-	0.06	-	-	-		-
Acifluorfen	T	zero	-	F	2	2	0.1	0.4	0.013	0.4	-	0.1		B2
Acrylamide	F	zero	TT	F	1.5	0.3	0.02	0.07	***0.0002***	0.007	-	0.001		B2
Acrylonitrile	T	zero	-	D	-	-	-	-	-	-	-	0.006		B1*
Adipate (diethylhexyl)	F	0.4	0.4	-	20	20	20	60	0.6	20	0.4	3		C
Alachlor	F	zero	0.002	F	0.1	0.1	-	-	0.01	0.4	-	0.04		B2
Aldicarb**	D	0.007	0.007	D	-	-	-	-	0.001	0.035	0.007	-		D
Aldicarb sulfone**	D	0.007	0.007	D	-	-	-	-	0.001	0.035	0.007	-		D
Aldicarb sulfoxide**	D	0.007	0.007	D	-	-	-	-	0.001	0.035	0.007	-		D
Aldrin	-	-	-	D	0.0003	0.0003	0.0003	0.0003	0.00003	0.001	-	0.0002		B2
Ametryn	-	-	-	F	9	9	0.9	3	0.009	0.3	0.06	-		D
Ammonium sulfamate	-	-	-	F	20	20	20	80	0.28	8	2	-		D
Anthracene (PAH)***	-	-	-	-	-	-	-	-	0.3	-	-	-		D
Atrazine	F	0.003	0.003	F	0.1	0.1	0.05	0.2	0.035	0.2*	0.003*	-		C
Baygon	-	-	-	F	0.04	0.04	0.04	0.1	0.004	0.1	0.003	-		C
Bentazon	T	0.02	-	F	0.3	0.3	0.3	0.9	0.0025	0.09	0.02	-		D
Benz(a)anthracene (PAH)	-	-	-	-	-	-	-	-	-	-	-	-		B2
Benzene	F	zero	0.005	F	0.2	0.2	-	-	-	-	-	0.1		A
Benzo(a)pyrene (PAH)	F	zero	0.002	-	-	-	-	-	-	-	-	0.0002*		[illegible]
Benzo(b)fluoranthene (PAH)	-	-	-	-	-	-	-	-	-	-	-	-		B2
Benzo(g,h,i)perylene (PAH)	-	-	-	-	-	-	-	-	-	-	-	-		D
Benzo(k)fluoranthene (PAH)	-	-	-	-	-	-	-	-	-	-	-	-		B2
bis-2-Chloroisopropyl ether	-	-	-	F	4	4	4	13	0.04	1	0.3	-		D
Bromacil	L	-	-	F	5	5	3	9	0.13	5	0.09	-		C
Bromobenzene	L	-	-	D	-	-	-	-	-	-	-	-		-

* *Under review.*
**NOTE: The HA value or the MCLG/MCL value for any two or more of these three chemicals should remain at 0.007 mg/L because of similar mode of action.
***PAH = Polyaromatic hydrocarbon
*See 40CFR Parts 141 and 142
NOTE: *Anthracene and Benzo(g,h,i)perylene — not proposed in Phase V.*
NOTE: Changes from the last version are noted in Italic and Bold Face print.

Drinking Water Standards and Health Advisories

Chemicals	Standards: Status Reg.	Standards: MCLG (mg/l)	Standards: MCL (mg/l)	Status HA	Health Advisories, 10-kg Child: One-day (mg/l)	10-kg Child: Ten-day (mg/l)	10-kg Child: Longer-term (mg/l)	70-kg Adult: Longer-term (mg/l)	70-kg Adult: RfD (mg/kg/day)	70-kg Adult: DWEL (mg/l)	70-kg Adult: Lifetime (mg/l)	70-kg Adult: mg/l at 10^{-4} Cancer Risk	Cancer Group
Bromochloroacetonitrile	T	-	-	D	-	-	-	-	-	-	-	-	-
Bromochloromethane	-	-	-	F	0.1	0.1	0.1	0.5	0.013	0.05	0.09	-	-
Bromodichloromethane (THM)	P	zero	0.1*/0.08*	D	6	6	4	13	0.02	0.7	-	0.06	[illegible]
Bromoform (THM)	P	zero	0.1*/0.08*	D	5	2	2	6	0.02	0.7	-	0.4	[illegible]
Bromomethane	T	-	-	F	0.1	0.1	0.1	0.5	0.001	0.04	0.01	-	D
Butyl benzyl phthalate (PAE)***	-	-	-	-	-	-	-	-	0.2	7	-	-	C
Butylate	-	-	-	F	2	2	1	4	0.05	2	0.35	-	D
Butylbenzene n-	-	-	-	D	-	-	-	-	-	-	-	-	-
Butylbenzene sec-	-	-	-	D	-	-	-	-	-	-	-	-	-
Butylbenzene tert-	-	-	-	D	-	-	-	-	-	-	-	-	-
Carbaryl	-	-	-	F	1	1	1	1	0.1	4	0.7	-	D
Carbofuran	F	0.04	0.04	F	0.05	0.05	0.05	0.2	0.005	0.2	0.04	-	E
Carbon tetrachloride	F	zero	0.005	F	4	0.2	0.07	0.3	0.0007	0.03	-	0.03	B2
Carboxin	-	-	-	F	1	1	1	4	0.1	4	0.7	-	D
Chloral hydrate	P	0.04	0.06**	D	7	0.2	0.2	0.6	0.0002	0.06	0.06	-	C
Chloramben	-	-	-	F	3	3	0.2	0.6	0.015	0.5	0.1	-	D
Chlordane	F	zero	0.002	F	0.06	0.06	-	-	0.00006	0.002	-	0.003	B2
Chlorodibromomethane (THM)	P	0.06	0.1*/0.08*	D	6	6	2	8	0.02	0.7	0.06	-	C
Chloroethane	L	-	-	D	-	-	-	-	-	-	-	-	B
Chloroform (THM)	P	zero	0.1*/0.08*	D	4	4	0.1	0.4	0.01	0.4	-	0.6	B2
Chloromethane	L	-	-	F	9	0.4	0.4	1	0.004	0.1	0.003	-	[illegible]
Chlorophenol (2-)	-	-	-	D	0.5	0.5	0.5	2.0	0.005	0.2	0.04	-	D
p-Chlorophenyl methyl sulfide/sulfone/sulfoxide	-	-	-	**	-	-	-	-	-	-	-	-	D
Chloropicrin	L	-	-	-	-	-	-	-	-	-	-	-	-
Chlorothalonil	-	-	-	F	0.2	0.2	0.2	0.5	0.015	0.5	-	0.15	B2
Chlorotoluene o-	L	-	-	F	2	2	2	7	0.02	0.7	0.1	-	D
Chlorotoluene p-	L	-	-	F	2	2	2	7	0.02	0.7	0.1	-	D
Chlorpyrifos	L	-	-	F	0.03	0.03	0.03	0.1	0.003	0.1	0.02	-	D
Chrysene (PAH)	-	-	-	-	-	-	-	-	-	-	-	-***	B2
Cyanazine****	T	0.001	-	D	0.1	0.1	0.02	0.07	0.002	0.07	0.001****	-	C

* Current MCL ¯A HA will not be developed due to insufficient data; a "Database Deficiency Report has been published.

' 1994 Proposed rule for Disinfectants and Disinfection By-products : Total for all THMs combined cannot exceed the 0.08 level.

**Total for all haloacetic acids cannot exceed 0.06 level. ***PAE = phthalate acid ester ****Draft HA updated for the Phase VIB regulation, which has been postponed. It includes the change of the cancer classification from D to C, thus justifying the use of an additional 10-fold safty factor for the lifetime HA.*

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Cyanogen chloride	T	-	-	-	-	-	-	-	-	-	-	-	-
Cymene p-	-	-	-	D	-	-	-	-	-	-	-	-	-
2,4-D	F	0.07	0.07	F	1	0.3	0.1	0.4	0.01	0.4	0.07	-	D
DCPA (Dacthal)	L	-	-	F	80	80	5	20	0.5	20	4	-	D
Dalapon	F	0.2	0.2	F	3	3	0.3	0.9	0.026	0.9	0.2	-	D
Di[2-ethylhexyl]adipate	F	0.4	0.4	-	20	20	20	60	0.6	20	0.4	3	C
Diazinon	-	-	-	F	0.02	0.02	0.005	0.02	0.00009	0.003	0.0006	-	E
Dibromoacetonitrile	L	-	-	D	2	2	2	8	0.02	0.8	0.02	-	C
Dibromochloropropane (DBCP)	F	zero	0.0002	F	0.2	0.05	-	-	-	-	-	0.003	B2
Dibromomethane	L	-	-	-	-	-	-	-	-	-	-	-	D
Dibutyl phthalate (PAE)	-	-	-	-	-	-	-	-	0.1	4	-	-	D
Dicamba	L	-	-	F	0.3	0.3	0.3	1	0.03	1	0.2	-	D
Dichloroacetaldehyde	L	-	-	D	-	-	-	-	-	-	-	-	-
Dichloroacetic acid	P	zero	0.06**	D	1	1	1	4	0.004	0.1	-	**	B2
Dichloroacetonitrile	L	-	-	D	1	1	0.8	3	0.008	0.3	0.008	-	C
Dichlorobenzene o-	F	0.6	0.6	F	9	9	9	30	0.09	3	0.6	-	D
Dichlorobenzene m- *	-	-	-	F	9	9	9	30	0.09	3	0.6	-	D
Dichlorobenzene p-	F	0.075	0.075	F	10	10	10	40	0.1	4	0.075	-	C
Dichlorodifluoromethane	L	-	-	F	40	40	9	30	0.2	5	1	-	D
Dichloroethane (1,2-)	F	zero	0.005	F	0.7	0.7	0.7	2.6	-	-	-	0.04	B2
Dichloroethylene (1,1-)	F	0.007	0.007	F	2	1	1	4	0.009	0.4	0.007	-	C
Dichloroethylene (cis-1,2-)	F	0.07	0.07	F	4	3	3	11	0.01	0.4	0.07	-	D
Dichloroethylene (trans-1,2-)	F	0.1	0.1	F	20	2	2	6	0.02	0.6	0.1	-	D
Dichloromethane	F	zero	0.005	F	10	2	-	-	0.06	2	-	0.5	B2
Dichlorophenol (2,4-)	-	-	-	D	0.03	0.03	0.03	0.1	0.003	0.1	0.02	-	D
Dichloropropane (1,1-)	-	-	-	D	-	-	-	-	-	-	-	-	-
Dichloropropane (1,2-)	F	zero	0.005	F	-	0.09	-	-	-	-	-	0.06	B2
Dichloropropane (1,3-)	L	-	-	D	-	-	-	-	-	-	-	-	-

* The values for m-dichlorobenzene are based on data for o-dichlorobenzene.

** A quantitative risk estimate has not been determined.

** Total for all haloacetic acids cannot exceed 0.06 level.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Dichloropropane (2,2-)	L	-	-	D	-	-	-	-	-	-	-	-	-
Dichloropropene (1,1-)	L	-	-	D	-	-	-	-	-	-	-	-	-
Dichloropropene (1,3-)	T	zero	-	F	0.03	0.03	0.03	0.09	0.0003	0.01	-	0.02	B2
Dieldrin	-	-	-	F	0.0005	0.0005	0.0005	0.002	0.00005	0.002	-	0.0002	B2
Diethyl phthalate (PAE)	-	-	-	D	-	-	-	-	0.8	30	5	-	D
Diethylene glycol dinitrate	-	-	-	*	-	-	-	-	-	-	-	-	-
Di(2-ethylhexyl)phthalate (PAE)	F	zero	0.006	D	-	-	-	-	0.02	0.7	-	0.3	B2
Diisopropyl methylphosphonate	-	-	-	F	8	8	8	30	0.08	3	0.6	-	D
Dimethrin	-	-	-	F	10	10	10	40	0.3	10	2	-	D
Dimethyl methylphosphonate	-	-	-	F	2	2	2	6	0.2	7	0.1	0.7	C
Dimethyl phthalate (PAE)	-	-	-	-	-	-	-	-	-	-	-	-	D
1,3-Dinitrobenzene	-	-	-	F	0.04	0.04	0.04	0.14	0.0001	0.005	0.001	-	D
Dinitrotoluene (2,4-)	L	-	-	F	0.50	0.50	0.30	1	0.002	0.1	-	0.005	B2
Dinitrotoluene (2,6-)	L	-	-	F	0.40	0.40	0.40	1	0.001	0.04	-	0.005	B2
tg 2,6 & 2,4 dinitrotoluene **	-	-	-	-	-	-	-	-	-	-	-	0.005	B2
Dinoseb	F	0.007	0.007	F	0.3	0.3	0.01	0.04	0.001	0.04	0.007	-	D
Dioxane p-	-	-	-	F	4	0.4	-	-	-	-	-	0.7	B2
Diphenamid	-	-	-	F	0.3	0.3	0.3	1	0.03	1	0.2	-	D
Diphenylamine	-	-	-	F	1	1	0.3	1	0.03	1	0.2	-	D
Diquat	F	0.02	0.02	*	-	-	-	-	0.0022	0.08	0.02	-	D
Disulfoton	-	-	-	F	0.01	0.01	0.003	0.009	0.00004 /	0.001	0.0003	-	E
Dithiane (1,4-)	-	-	-	F	0.4	0.4	0.4	1	0.01	0.4	0.08	-	D
Diuron	-	-	-	F	1	1	0.3	0.9	0.002	0.07	0.01	-	D
Endothall	F	0.1	0.1	F	0.8	0.8	0.2	0.2	0.02	0.7	0.1	-	D
Endrin	F	0.002	0.002	F	0.02	0.02	0.003	0.01	0.0003	0.01	0.002	-	D
Epichlorohydrin	F	zero	TT	F	0.1	0.1	0.07	0.07	0.002	0.07	-	0.4	B2
Ethylbenzene	F	0.7	0.7	F	30	3	1	3	0.1	3	0.7	-	D
Ethylene dibromide (EDB)	F	zero	0.00005	F	0.008	0.008	-	-	-	-	-	0.00004	B2
Ethylene glycol	-	-	-	F	20	6	6	20	2	40	7	-	D
ETU	L	-	-	F	0.3	0.3	0.1	0.4	0.00008	0.003	-	0.03	B2
Fenamiphos	-	-	-	F	0.009	0.009	0.005	0.02	0.00025	0.009	0.002	-	D

* An HA will not be developed due to insufficient data; a "Database Deficiency Report" has been published.

** tg = technical grade

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		10-kg Child			70-kg Adult					
					One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Fluometron	-	-	-	F	2	2	2	5	0.013	0.4	0.09		D
Fluorene (PAH)	-	-	-	-	-	-	-	-	0.04	-	-	-	D
Fluorotrichloromethane	L	-	-	F	7	7	3	10	0.3	10	2	-	D
Fog Oil	-	-	-	D	-	-	-	-	-	-	-	-	-
Fonofos	-	-	-	F	0.02	0.02	0.02	0.07	0.002	0.07	0.01	-	D
Formaldehyde	D	-	-	D	10	5	5	20	0.15	5	1	-	B1**
Gasoline, unleaded (benzene)	-	-	-	D	-	-	-	-	-	-	0.005	-	-
Glyphosate	F	0.7	0.7	F	20	20	1	1	0.1	4	0.7	-	E
Heptachlor	F	zero	0.0004	F	0.01	0.01	0.005	0.005	0.0005	0.02	-	0.0008	B2
Heptachlor epoxide	F	zero	0.0002	F	0.01	-	0.0001	0.0001	1E-5	0.0004	-	0.0004	B2
Hexachlorobenzene	F	zero	0.001	F	0.05	0.05	0.05	0.2	0.0008	0.03	-	0.002	B2
Hexachlorobutadiene	T	0.001	-	F	0.3	0.3	0.1	0.4	0.002	0.07	0.001	-	C
Hexachlorocyclopentadiene	F	0.05	0.05	-	-	-	-	-	0.007	0.2	-	-	D
Hexachloroethane	L	-	-	F	5	5	0.1	0.5	0.001	0.04	0.001	-	C
Hexane (n-)	-	-	-	F	10	4	4	10	-	-	-	-	D
Hexazinone	-	-	-	F	3	3	3	9	0.033*	1*	0.2*	-	D
HMX	-	-	-	F	5	5	5	20	0.05	2	0.4	-	D
Indeno(1,2,3,-c,d)pyrene (PAH)	-	-	-	D	-	-	-	-	-	-	-	-***	B2
Isophorone	L	-	-	F	15	15	15	15	0.2	7	0.1	4	C
Isopropyl methylphosphonate	-	-	-	D	30	30	30	100	0.1	4.0	0.7	-	D
Isopropylbenzene	-	-	-	D	-	-	-	-	-	-	-	-	[illegible]
Lindane	F	0.0002	0.0002	F	1	1	0.03	0.1	0.0003	0.01	0.0002	-	C
Malathion	-	-	-	F	0.2	0.2	0.2	0.8	0.02	0.8	0.2	-	D
Maleic hydrazide*	-	-	-	F	10	10	5	20	0.5	20	4	-	D
MCPA	-	-	-	F	0.1	0.1	0.1	0.4	0.0015	0.05	0.01	-	E
Methomyl	L	-	-	F	0.3	0.3	0.3	0.3	0.025	0.9	0.2	-	D
Methoxychlor	F	0.04	0.04	F	0.05	0.05	0.05	0.2	0.005	0.2	0.04	-	D
Methyl ethyl ketone	-	-	-	F	-	-	-	-	-	-	-	-	*
Methyl parathion	-	-	-	F	0.3	0.3	0.03	0.1	0.00025	0.009	0.002	-	D

* Under review.
** Carcinogenicity based on inhalation exposure.
***See 40CFR Parts 141 and 142

Chemicals	Standards: Status Reg.	Standards: MCLG (mg/l)	Standards: MCL (mg/l)	Status HA	Health Advisories: 10-kg Child: One-day (mg/l)	10-kg Child: Ten-day (mg/l)	10-kg Child: Longer-term (mg/l)	70-kg Adult: Longer-term (mg/l)	70-kg Adult: RfD (mg/kg/day)	70-kg Adult: DWEL (mg/l)	70-kg Adult: Lifetime (mg/l)	70-kg Adult: mg/l at 10^{-4} Cancer Risk	Cancer Group
Methyl tert butyl ether	L	-	-	D	24	24	3	12	0.03	1.0	0.02-0.2*		C***
Metolachlor	L	-	-	F	2	2	2	5.0	0.1	5.0	0.1	-	C
Metribuzin	L	-	-	F	5	5	0.3	0.5	0.013**	0.5	0.1	-	D
Monochloroacetic acid	L	-	-	D	-	-	-	-	-	-	-	-	[illegible]
Monochlorobenzene	F	0.1	0.1	F	2	2	2	7	0.02	0.7	0.1	-	D
Naphthalene	-	-	-	F	0.5	0.5	0.4	1	0.004	0.1	0.02	-	D
Nitrocellulose (non-toxic)	-	-	-	F	-	-	-	-	-	-	-	-	-
Nitroguanidine	-	-	-	F	10	10	10	40	0.1	4	0.7	-	D
Nitrophenol p-	-	-	-	F	0.8	0.8	0.8	3	0.008	0.3	0.06	-	D
Oxamyl (Vydate)	F	0.2	0.2	F	0.2	0.2	0.2	0.9	0.025	0.9	0.2	-	E
Paraquat	-	-	-	F	0.1	0.1	0.05	0.2	0.0045	0.2	0.03	-	E
Pentachloroethane	-	-	-	D	-	-	-	-	-	-	-	-	-
Pentachlorophenol	F	zero	0.001	F	1	0.3	0.3	1	0.03	1	-	0.03	B2
Phenanthrene (PAH)	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	-	-	D	6	6	6	20	0.6	20	4	-	D
Picloram	F	0.5	0.5	F	20	20	0.7	2	0.07	2	0.5	-	D
Polychlorinated biphenyls (PCBs)	F	zero	0.0005	P	-	-	-	-	-	-	-	0.0005	B2
Prometon	L	-	-	F	0.2	0.2	0.2	0.5	0.015*	0.5*	0.1*	-	D
Pronamide	-	-	-	F	0.8	0.8	0.8	3	0.075	3	0.05	-	C
Propachlor	-	-	-	F	0.5	0.5	0.1	0.5	0.013	0.5	0.09	-	[illegible]
Propazine	-	-	-	F	1	1	0.5	2	0.02	0.7	0.01	-	[illegible]
Propham	-	-	-	F	5	5	5	20	0.02	0.6	0.1	-	D
Propylbenzene n-	-	-	-	D	-	-	-	-	-	-	-	-	-
Pyrene (PAH)	-	-	-	-	-	-	-	-	0.03	-	-	-	D
RDX	-	-	-	F	0.1	0.1	0.1	0.4	0.003	0.1	0.002	0.03	C
Simazine	F	0.004	0.004	F	0.07	0.07	0.07	0.07	0.005	0.2	0.004	-	C
Styrene	F	0.1	0.1	F	20	2	2	7	0.2	7	0.1	-	C
2,4,5-T	L	-	-	F	0.8	0.8	0.8	1	0.01	0.35	0.07	-	D
2,3,7,8-TCDD (Dioxin)	F	zero	3E-08	F	1E-06	1E-07	1E-08	4E-08	1E-09	4E-08	-	2E-08	B2

* Under review. NOTE: Phenanthrene — not proposed.

** The RfD for metribuzin was revised Dec. 1994 to 0.013 mg/kg/day. Based on this revised RfD the Lifetime HA would be 0.1 mg/l assuming a 20% relative source contribution for drinking water. *This information has not been incorporated in the Health Advisory document.*

*** Tentative.

* *If the cancer classification C is accepted, the Lifetime HA is 0.20; other wise it is 0.200 mg/L.*

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Tebuthiuron	-	-	-	F	3	3	0.7	2	0.07	2	0.5	-	D
Terbacil	-	-	-	F	0.3	0.3	0.3	0.9	0.013	0.4	0.09	-	E
Terbufos	-	-	-	F	0.005	0.005	0.001	0.005	0.00013	0.005	0.0009	-	D
Tetrachloroethane (1,1,1,2-)	L	-	-	F	2	2	0.9	3	0.03	1	0.07	0.1	C
Tetrachloroethane (1,1,2,2-)	L	-	-	D	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	F	zero	0.005	F	2	2	1	5	0.01	0.5	-	0.07	-
Tetranitromethane	-	-	-	**	-	-	-	-	-	-	-	-	-
Toluene	F	1	1	F	20	2	2	7	0.2	7	1	-	D
Toxaphene	F	zero	0.003	F	-	-	-	-	0.1*	-	-	0.003	B2
2,4,5-TP	F	0.05	0.05	F	0.2	0.2	0.07	0.3	0.0075	0.3	0.05	-	D
1,1,2-Trichloro-1,2,2-trifluoroethane	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroacetic acid	P	0.3	0.06**	D	4	4	4	13	0.1	4.0	0.3	-	C
Trichloroacetonitrile	L	-	-	D	0.05	0.05	-	-	-	-	-	-	-
Trichlorobenzene (1,2,4-)	F	0.07	0.07	F	0.1	0.1	0.1	0.5	0.001	0.04	0.07	-	D
Trichlorobenzene (1,3,5-)	-	-	-	F	0.6	0.6	0.6	2	0.006	0.2	0.04	-	D
Trichloroethane (1,1,1-)	F	0.2	0.2	F	100	40	40	100	0.035	1	0.2	-	D
Trichloroethane (1,1,2-)	F	0.003	0.005	F	0.6	0.4	0.4	1	0.004	0.1	0.003	-	C
Trichloroethanol (2,2,2-)	L	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	F	zero	0.005	F	-	-	-	-	-	0.3	-	0.3	B2
Trichlorophenol (2,4,6-)	L	-	-	D	-	-	-	-	-	-	-	0.3	B2
Trichloropropane (1,1,1-)	-	-	-	D	-	-	-	-	-	-	-	-	-
Trichloropropane (1,2,3-)	L	-	-	F	0.6	0.6	0.6	2	0.006	0.2	0.04	0.5	B2
Trifluralin	L	-	-	F	0.08	0.08	0.08	0.3	0.0075	0.3	0.005	0.5	C
Trimethylbenzene (1,2,4-)	-	-	-	D	-	-	-	-	-	-	-	-	-
Trimethylbenzene (1,3,5-)	-	-	-	D	-	-	-	-	-	-	-	-	-
Trinitroglycerol	-	-	-	F	0.005	0.005	0.005	0.005	-	-	0.005	-	-
Trinitrotoluene	-	-	-	F	0.02	0.02	0.02	0.02	0.0005	0.02	0.002	0.1	C
Vinyl chloride	F	zero	0.002	F	3	3	0.01	0.05	-	-	-	0.0015	A
Xylenes	F	10	10	F	40	40	40	100	2	60	10	-	D

* Under review.

** A HA will not be developed due to insufficient data; a "Database Deficiency Report" has been published.

** Total for all haloacetic acids cannot exceed 0.06 mg/l level.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Health Advisories									Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)	Status HA	One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
INORGANICS													
Aluminum	L	-	-	D	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	D	-	-	-	-	-	-	30	-	D
Antimony	F	0.006	0.006	F	0.01	0.01	0.01	0.015	0.0004	0.01	0.003	-	D
Arsenic	*	-	0.05	D	-	-	-	-	-	-	-	0.002	A
Asbestos (fibers/l >10μm length)	F	7 MFL	7 MFL	-	-	-	-	-	-	-	-	700 MFL	A
Barium	F	2	2	F	-	-	-	-	0.07	2	2	-	D
Beryllium	F	0.004	0.004	D	30	30	4	20	0.005	0.2	-	0.0008	B2
Boron	L	-	-	D	4	0.9	0.9	3	0.09	3	0.6	-	D
Bromate	L	zero	0.01	-	-	-	-	-	-	-	-	-	-
Cadmium	F	0.005	0.005	F	0.04	0.04	0.005	0.02	0.0005	0.02	0.005	-	D
Chloramine	P	4***	4	D	1	1	1	1	0.1	3.3	3/4***	-	-
Chlorate	L	-	-	D	-	-	-	-	-	-	-	-	-
Chlorine	P	4	4	D	-	-	-	-	0.1	-	-	-	D
Chlorine dioxide	T	0.3	0.8	D	-	-	-	-	0.01	0.35	0.3	-	D
Chlorite	L	0.08	1	D	-	-	-	-	0.003	0.1	0.08	-	D
Chromium (total)	F	0.1	0.1	F	1	1	0.2	0.8	0.005	0.2	0.1	-	D
Copper (at tap)	F	1.3	TT**	-	-	-	-	-	-	-	-	-	D
Cyanide	F	0.2	0.2	F	0.2	0.2	0.2	0.8	0.022	0.8	0.2	-	D
Fluoride*	F	4	4	-	-	-	-	-	0.12	-	-	-	-
Hypochlorite	P	4[1]	-	-	-	-	-	-	-	-	-	-	[illegible]
Hypochlorous acid	P	4[1]	-	-	-	-	-	-	-	-	-	-	-
Lead (at tap)	F	zero	TT**	-	-	-	-	-	-	-	-	-	B2
Manganese	L	-	-	D	-	-	-	-	0.14[2]	-	-	-	-
Mercury (inorganic)	F	0.002	0.002	F	-	-	-	0.002	0.0003	0.01	0.002	-	D
Molybdenum	L	-	-	D	*0.02*	*0.02*	*0.01*	0.05	0.005	0.2	0.04	-	D
Nickel	F	0.1[4]	0.1[4]	F	1	1	0.5	1.7	0.02	0.6	0.1	-	D
Nitrate (as N)	F	10	10	F	-	10*	-	-	1.6	-	-	-	-

* Under review.

** Copper — action level 1.3 mg/L, Lead — action level 0.015 mg/L

*** Measured as free chlorine.

[1] Regulated as chlorine.

[2] In food.

[3] In water.

[4] Being remanded

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Nitrite (as N)	F	1	1	F	-	1*	-	-	0.16*	-	-	-	-
Nitrate + Nitrite (both as N)	F	10	10	F	-	-	-	-	-	-	-	-	-
Selenium	F	0.05	0.05	-	-	-	-	-	0.005	-	-	-	
Silver	-	-	-	D	0.2	0.2	0.2	0.2	0.005	0.2	0.1	-	[illegible]
Sodium	-	-	-	D	-	-	-	-	-	20**	-	-	-
Strontium	L	-	-	D	25	25	25	90	0.6	90	17	-	D
Sulfate	P	*500*	*500*	D	-	-	-	-	-	-	-	-	-
Thallium	F	0.0005	0.002	F	0.007	0.007	0.007	0.02	0.00007	0.002	0.0004	-	-
Vanadium	*T*	-	-	D	-	-	-	-	-	-	-	-	D
White phosphorous	-	-	-	F	-	-	-	-	0.00002	0.0005	0.0001		D
Zinc	L	-	-	F	6	6	3	10	0.3	10	2	-	D
Zinc chloride (measured as Zinc)	L	-	-	F	6	6	3	10	0.3	10	2	-	D
RADIONUCLIDES													
Beta particle and photon activity (formerly man-made radionuclides)	*F*	zero	4 mrem	-	-	-	-	-	-	-	-	4 mrem/y	A
Gross alpha particle activity	*F*	zero	15 pCi/L	-	-	-	-	-	-	-	-	15 pCi/L	A
Combined Radium 226 & 228	*F*	zero	5 pCi/L	-	-	-	-	-	-	-	-	20 pCi/L	A
Radon	P	zero	300 pCi/L+	-	-	-	-	-	-	-	-	150 pCi/L	[illegible]
Uranium	P	zero	20 µg/L	-	-	-	-	-	0.003	-	-	-	A

* Under review. ** Guidance.
+1991 Proposed National Primary Drinking Water Rule for Radionuclides

not [illegible]
[illegible] se level [illegible]

Secondary Maximum Contaminant Levels

November 1995

Chemicals	Status	SMCLs (mg/L)
Aluminum	F	0.05 to 0.2
Chloride	F	250
Color	F	15 color units
Copper	F	1.0
Corrosivity	F	non-corrosive
Fluoride*	F	2.0
Foaming agents	F	0.5
Iron	F	0.3
Manganese	F	0.05
Odor	F	3 threshold odor numbers
pH	F	6.5 — 8.5
Silver	F	0.1
Sulfate	F	250
Total dissolved solids (TDS)	F	500
Zinc	F	5

Status Codes: P — proposed, F — final

* Under review.

Microbiology

	Status	MCLG	MCL
Cryptosporidium	L	-	-
Giardia lamblia	F	zero	TT
Legionella	F[#]	zero	TT
Standard Plate Count	F[#]	NA	TT
Total Coliforms	F	zero	**
Turbidity	F	NA	PS
Viruses	F[#]	zero	TT

Key: PS, TT, F, defined as previously stated.

Final for systems using surface water; also being considered for regulation under groundwater disinfection rule.

11/95 EPA HEALTH ADVIS.

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Export Gopher

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z All ?

-205	Health Advisory - Acifluorfen	2.50
-206	Health Advisory - Ametryn	1.75
-207	Health Advisory - Ammonium Sulfamate	1.25
-208	Health Advisory - Atrazine	3.00
-209	Health Advisory - (Baygon) Propoxur	2.50
-210	Health Advisory - Bentazon	1.50
-211	Health Advisory - Bromacil	2.25
-212	Health Advisory - Butylate	2.00
-213	Health Advisory - Carbaryl	2.25
-214	Health Advisory - Carboxin	2.00
-215	Health Advisory - Chloramben	2.00
-216	Health Advisory - Chlorothalonil	2.75
-217	Health Advisory - Cyanazine	2.50
-218	Health Advisory - DCPA (Dacthal)	1.75
-219	Health Advisory - Dalapon	1.75
-220	Health Advisory - Diazinon	2.25
-221	Health Advisory - Dicamba	2.00
-222	Health Advisory - 1, 3 - Dichloropropene	2.25

38.25

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D-223	Health Advisory - Dieldrin	1.75
D-224	Health Advisory - Dimethrin	1.50
D-225	Health Advisory - Dinoseb	1.75
D-226	Health Advisory - Diphenamid	1.50
D-227	Health Advisory - Terbacil	3.50
D-228	Health Advisory - Disulfoton	2.25
D-229	Health Advisory - Diuron	2.25
D-230	Health Advisory - Endothall	2.00
D-231	Health Advisory - Ethylene Thiourea (ETU)	2.25
D-232	Health Advisory - Fenamiphos	2.00
D-233	Health Advisory - Fluometuron	2.00
D-234	Health Advisory - Fonofos	2.00
D-235	Health Advisory - Glyphosate	1.50
D-236	Health Advisory - Hexazinone	2.25
D-237	Health Advisory - Maleic Hydrazide	2.25
D-238	Health Advisory - MCPA (4-Chloro-2-Methylphenoxy) - Acetic Acid	2.25
D-239	Health Advisory - Methomyl	2.25
D-240	Health Advisory - Methyl Parathion	3.00

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D-241	Health Advisory - Metolachlor	2.25
D-242*	Health Advisory - Metribuzin	2.25
D-243	Health Advisory - Paraquat	2.25
D-244	Health Advisory - Picloram	2.25
D-245	Health Advisory - Prometon	2.00
D-246	Health Advisory - Pronamide	2.25
D-247	Health Advisory - Propachlor	1.75
D-248	Health Advisory - Propazine	2.00
D-249	Health Advisory - Propham	2.00
D-250	Health Advisory - Simazine	2.75
D-251	Health Advisory - 2, 4, 5 - Trichlorophenoxyacetic Acid	3.00
D-252	Health Advisory - Tebuthiuron	2.00
D-253	Health Advisory - Terbufos	2.25
D-254	Health Advisory - Trifluralin	2.75
D-255	Health Advisory - Alachlor	2.00
D-256	Health Advisory - Aldicarb (Sulfoxide and Sulfone)	2.25
D-257	Health Advisory - Carbofuran	2.00
D-258	Health Advisory - Chlordane	2.50

40.50

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D-259	Health Advisory - 1, 2 - Dibromo - 3 - Chloropropane (DBCP)	2.75
D-260	Health Advisory - 2, 4 - Dichlorophenoxyacetic Acid	1.75
D-261	Health Advisory - 1, 2 - Dichloropropane	1.75
D-262	Health Advisory - Ethylene Dibromide	2.50
D-263	Health Advisory - Endrin	2.25
D-264	Health Advisory - Heptachlor and Heptachlor Epoxide	2.50
D-265	Health Advisory - Lindane	2.25
D-266	Health Advisory - Methoxychlor	2.00
D-267	Health Advisory - Oxamyl	1.50
D-268	Health Advisory - Pentachlorophenol	2.00
D-269	Health Advisory - Toxaphene	1.75
D-270	Health Advisory - 2, 4, 5 - *Trichlorophenoxyacetic* Acid Microbiological	3.0
D-271	Health Advisory - Legionella - Control of in Plumbing Systems (part of the microbiological health advisory group)	1.75
D-272	Health Advisory - Aldrin	3.00
D-273	Health Advisory - Ammonia	1.75
D-274	Health Advisory - Antimony	3.50
D-275	Health Advisory - Beryllium	3.00
D-276	Health Advisory - Boron	3.00

42.00

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D-277	Health Advisory - Chlorpyrifos	3.50
D-278	Health Advisory - Isopherone	2.25
D-279	Health Advisory - Malathion	2.50
D-280	Health Advisory - Phenol	2.75
D-281	Health Advisory - p-Nitrophenol	2.50
D-282	Health Advisory - Silver	3.50
D-283	Health Advisory - Thallium	3.50
D-284	Health Advisory - Dichloromethane	1.75
D-285	Health Advisory - 1, 2 - Dichloropropane	1.75
D-286	Health Advisory - Formaldehyde - Informal Guidance Level for	1.25
D-287	Health Advisory - Lead	2.25
D-288	Health Advisory - p-Dioxane	1.25
D-289	Health Advisory - Zinc Chloride	3.25
D-290	Health Advisory - Bromochloromethane	1.75
D-291	Health Advisory - Bromomethane	2.25
D-292	Health Advisory - bis - (2 - Chloroisopropyl) Ether	1.75
D-293	Health Advisory - Chloromethane	2.75
D-294	Health Advisory - Dichlorodifluoromethane	2.25

48.75

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D-295	Health Advisory - Hexachlorobutadiene	2.50
D-296	Health Advisory - Napthalene	2.75
D-297	Health Advisory - o-Chlorotoluene	2.00
D-298	Health Advisory - p-Chlorotoluene	1.75
D-299	Health Advisory - 1,1,1,2-Tetrachloroethane	2.00
D-300	Health Advisory - 1,2,4-Trichlorobenzene	2.75
D-301	Health Advisory - 1,3,5-Trichlorobenzene	2.00
D-302	Health Advisory - 1,1,2-Trichloroethane	2.50
D-303	Health Advisory - 1,2,3-Trichloropropane	1.75
D-304	Health Advisory - Trichlorofluoromethane	2.25
D-305	Health Advisory - Barium	1.75
D-306	Health Advisory - Cadmium	2.25
D-307	Health Advisory - Chromium	2.25
D-308	Health Advisory - Cyanide	2.00
D-309	Health Advisory - Mercury	1.50
D-310	Nickel Health Advisory (Interim Draft)	1.75 7/95
D-311	Health Advisory - Nitrate/Nitrite	2.25
D-312	Health Advisory - Diethylene Glycol Dinitrate (DEGDN) - Data Deficiencies, Problem Areas, and Recommendations for Additional Database Development for	4.50

40.50

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D-313	Health Advisory - Diisopropyl Methylphosphonate (DIMP)	9.25
D-314	Health Advisory - Dimethyl Methylphosphonate (DMMP)	9.25
D-315	Health Advisory - 1,3-Dinitrobenzene	10.25
D-316	Health Advisory - 2,4- and 2,6-Dinitrotoluene (DNT)	22.75
D-317	Health Advisory - Diphenylamine (DPA)	11.25
D-318	Health Advisory - 1,4-Dithiane	8.00
D-319	Health Advisory - Hexachloroethane	9.50
D-320	Health Advisory - Hexahydro-1,3,5,7-tetranitro 1,3,5,7-tetrazocine (RDX)	12.00
D-321	Health Advisory - Isopropyl Methylphosphonic Acid	6.75
D-322	Health Advisory - Nitrocellulose	4.00
D-323	Health Advisory - Nitroguanidine (NQ)	10.25
D-324	Health Advisory - Octahydro-1,3,5,7-tetranitro 1,3,5,7-tetrazocine (HMX)	7.25
D-325	Health Advisory - p-Chlorophenyl Methyl Sulfide, -Sulfoxide, and -Sulfone (PCPMS, PCPMSO, and PCPMSO2) - Data Deficiencies, Problem Areas, and	8.50
D-326	Health Advisory - Tetranitromethane (TNM) - Data Deficiencies, Problem Areas, and Recommendations for Additional Database Development for	5.50
D-327	Health Advisory - Trinitroglycerol	10.25
D-328	Health Advisory - Trinitrotoluene	14.50
D-329	Health Advisory - White Phosphorous Office of Ground Water and Drinking Water Documents	9.25
D-426	Acrylamide Health Advisory	2.25

170.75

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D-427	Benzene Health Advisory	2.25
D-428	Carbon Tetrachloride Health Advisory	2.25
D-429	Chlorobenzene Health Advisory	2.25
D-430	Ortho-, Meta-, and Para-Dichlorobenzenes Health Advisory	2.75
D-431	1, 2- Dichloroethane Health Advisory	2.25
D-432	1, 1- Dichloroethylene Health Advisory	2.2
D-433	CIS-1, 2-Dichloroethylene Health Advisory	2.25
D-434	Trans-1, 2-Dichloroethylene Health Advisory	2.25
D-435	Epichlorohydrin Health Advisory	2.25
D-436	Ethylbenzene Health Advisory	2.25
D-437	Ethylene Glycol Health Advisory	2.25
D-438	Hexachlorobenzene Health Advisory	2.25
D-439	n-Hexane Health Advisory	2.25
D-440	Methyl Ethyl Ketone Health Advisory	2.
D-441	Styrene Health Advisory	2.25
D-442	2,3,7,8-Tetrachlorodibenzo-p-Dioxin Health Advisory	2.50
D-443	Tetrachloroethylene (PCE) Health Advisory	2.25
D-444	Toluene Health Advisory	2.25

41.25

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D-446	Trichloroethylene Health Advisory	2.50
D-447	Vinyl Chloride Health Advisory	2.25
D-448	Xylenes Health Advisory	2.25
D-771 822/K-94-001	Cryptosporidium Health Advisory (part of the microbiological health advisory group)	3.50 1994
G-564	National Survey of Pesticides in Drinking Water Wells: Health Advisory Summaries	13.25
D-060	Methyl-t-Butyl Ether Drinking Water Health Advisory (Draft)	3.50 Jan-92
D-A10	Methyl- t- Butyl Ether Drinking Water Health Advisory (Draft)	3.50 Jan-92
G-045	Zinc Health Advisory (Draft)	4.50 Dec-90

35.25

Total charge: $495.50

REFERENCE 25

~~88595~~

Joy Ishigo
ORIGINATOR

WESTON
PHONE CONVERSATION RECORD

CONVERSATION WITH: **DATE:** 3/5/96

NAME: Bryan Sampey (Plant Manger) **TIME:** 10:30 AM

COMPANY: Houma Public Water Plant X **ORIGINATOR PLACED CALL**

ADDRESS: **ORIGINATOR RECEIVED CALL**

PHONE: (504) 857-9633 **W.O. NO.:** 046030260310100-00

SUBJECT: Drinking Water Intakes

NOTES: Confirmed that Houma's public supply comes form the Intercoastal Waterway and Bayou Black. Plant is at the intersection of Bayou Black and the Waterway. The Waterway is the main source, and the Bayou is used as a back up when saltwater intrusion is a problem. When the southeast winds come, then saltwater intrusion is a problem. Also, when the intrusion occurs, then there is a chance that IF Delta Shipyards is contaminating Bayou LaCarp, then contamination could enter the drinking water supply. They serve 31750 in Houma and two other districs; Dulac and Dularge.

FILE:

TICKLE FILE:

FOLLOW-UP-BY: He will have plant engineer call me back if there is any other information I need.

COPY/ROUTE TO:

FOLLOW-UP BY:

REFERENCE 26

~~88596~~

Joy Ishigo
ORIGINATOR

WESTON
PHONE CONVERSATION RECORD

CONVERSATION WITH: **DATE:** 3/14/96

NAME: Prosper Toups **TIME:** 3:30 PM

COMPANY: Main Office for Public Water Supply of Louisiana X **ORIGINATOR PLACED CALL**

ADDRESS: **ORIGINATOR RECEIVED CALL**

PHONE: (504) 879-2495 **W.O. NO.:** 046030260310100-00

SUBJECT: Drinking Water Supply

NOTES: Bryan Sampey of the Houma Public Water Plant mentioned that some of the water from his plant was sent to Dularge and Dulac. I obtained the amount of people serviced in these two areas from Mr. Toups. He stated that 400 meters were serviced with this water and there were 3 people per meter. So, about 1200 people are serviced in these two areas.

FILE:

TICKLE FILE:

FOLLOW-UP-BY:

COPY/ROUTE TO:

FOLLOW-UP-ACTION:

REFERENCE 27

~~88597~~

REFERENCE 28

~~88599~~

5 March 1996

Joy -

We have no records of Endangered or threatened species in your study area. Enclosed is a list of listed species by parish and a booklet describing all listed species in the state. If you have any questions give me a call (318) 262-6662, ext. 237).

Virginia Rettig

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL	# of pages ▶ 1
To Eric Tate	From Virginia Rettig
Dept./Agency Weston	Phone # 318/262-6662
Fax # 713/621-6959	Fax # 318/262-6663
NSN 7540-01-317-7368 5099-101	GENERAL SERVICES ADMINISTRATION

THREATENED & ENDANGERED SPECIES OF LOUISIANA

September 1995
Add- and update-pages will be available as necessary.

ISBN 0-9638600-3-8

This public document was printed at a total cost of $9,536.89. One thousand copies were printed by Bourque Printing. This document was printed under authority of R. S. 39:21 and in accordance with standards for printing by state agencies established pursuant to R. S. 43:31. Funding was provided by the Department of Wildlife and Fisheries (Conservation Fund) and the U. S. Department of the Interior, Fish and Wildlife Service (Section 6 Endangered Species Fund). This document was published by the Natural Heritage Program of the Louisiana Department of Wildlife and Fisheries, 2000 Quail Drive, Baton Rouge, LA 70808 to provide information on Louisiana's threatened and endangered species of animals and plants to all interested persons.

Published and produced by Natural Heritage Program
Louisiana Department of Wildlife & Fisheries

U.S. Fish & Wildlife Service

Piping Plover
Charadrius melodus

Federal Status: Threatened/Endangered[1]
(December 11, 1985)
State Status: Threatened/Endangered[1]
(December 20, 1989)

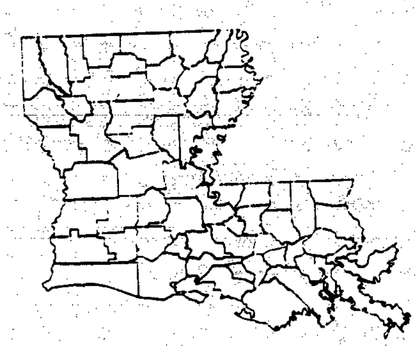
Description: A relatively small plover, light brown to sandy-gray above, white below. Breeding-plumage adults possess a single, narrow black breast band, a black bar on the front part of the crown that extends to the eyes, a stubby bill with orange base and black tip, and orange legs. Winter-plumage adults and juveniles are grayer, lack the contrasting black markings, only show a sandy patch on each side of breast and have completely black bills. All plumages have a white rump. Adults to 18 cm (7 in) total length; wingspread to 39 cm (15.4 in). The similar Snowy Plover and Semipalmated Plover lack the white rump; additionally, the former has dark legs and the latter is darker and usually has a complete breast band. Usually found singly or in pairs; occasionally in small flocks. Active forager; runs a short distance, pauses, catches a prey item, then continues. Feeds on a variety of aquatic invertebrates such as insects, crustaceans and mollusks.

Habitat: Generally found on beaches and mudflats of barrier islands and southeastern coastal parishes.

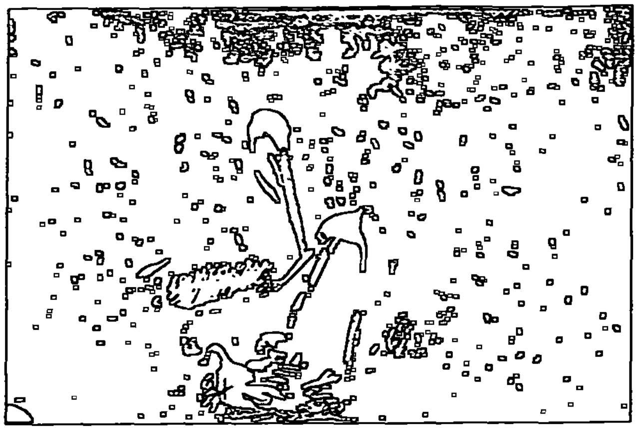
Distribution: Three recognized breeding populations: 1) U.S. and Canadian Great Plains, from Nebraska north to Alberta and Manitoba, 2) beaches bordering the Great Lakes, 3) Atlantic coastal beaches from North Carolina to Newfoundland. Has declined greatly in abundance and distribution in recent years. Winter distribution includes the southern Atlantic and Gulf coast, and several Caribbean islands. In Louisiana, a rare migrant statewide and uncommon winter resident along the coast and on barrier islands. One bird observed on Chandeleur Island, St. Bernard Parish, November 1987 had been banded in the prairie region of Canada.

Reasons for decline: Human disturbances and destruction of nests and young; (2) loss of nesting habitat from erosion of nesting and wintering habitat, irrigation projects, woody species encroachment, pollutants, predation (especially by raccoons), livestock trampling, and disturbance by dogs.

Conservation efforts: (1) Restrict access to nesting beaches; (2) annual surveys of nesting and wintering populations; (3) research on diet and feeding habits, and effect of pesticides and pollutants on populations; (4) identify migration routes; (5) determine wintering ecology.



[1] Because both populations of this species winter in Louisiana, we have some birds that represent the threatened population, and some that represent the endangered population.



© Julia Sims

Brown Pelican

Pelecanus occidentalis

Federal Status: Endangered (October 17, 1970; June 2, 1970; February 4, 1985)
State Status: Endangered (December 20, 1989)

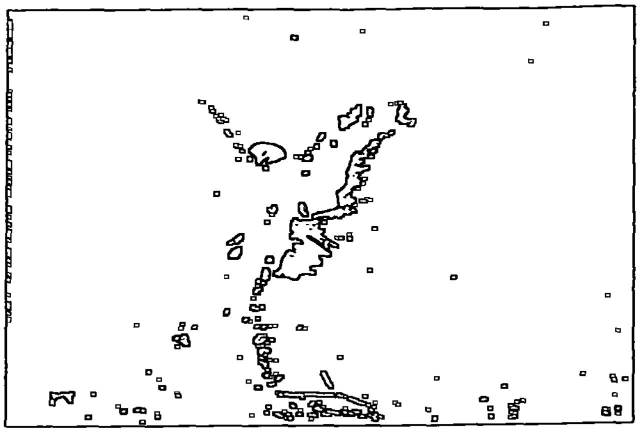
Description: Unmistakable, large brown waterbird with long, flat bill and distendable gular (throat) pouch. Body plumage of adults gray–brown to silver–brown; wing feathers darker. Head and neck of non–breeding adults white. Hindneck and nape cinnamon–brown during the breeding season. Bill gray to brown. Immature generally brown with some pale mottling on wings and neck; underpart whitish. In flight, neck is retracted heron-style. Adults 107–137 cm (42–54 in) long, wingspread to 2.4 m (7.9 ft). Usually found in small flocks. Flies just above water surface (in contrast to White Pelican); rarely soars. Usually found in bays, tidal estuaries or along the coast. Between November and July, lays clutch of 2–3 (usually 3) eggs in nest on ground or in low shrubs. Renesting after failed nesting attempt is common.

Habitat: Nests usually in shrub thickets within dunes of barrier islands. Feeds in deep and shallow coastal waters.

Distribution: Currently nests in scattered colonies from southern California and North Carolina south along the coast to Chile and Venezuela. In Louisiana, formerly an abundant resident with more than 50,000 birds present in 1919. Extirpated by 1963, probably due to organochloride accumulations. Subsequent reintroduction efforts have re–established nesting colonies on North Island, St. Bernard Parish, Queen Bess/Camp Islands, Jefferson Parish, Isle Dernieres, Terrebonne Parish, and along the Mississippi River in Plaquemines Parish. May be observed in near-shore waters throughout the eastern one–half of the Louisiana coastal region during the non–breeding season; rare west of Atchafalaya Bay.

Reasons for decline: (1) Severe pesticide poisoning (endrin) from DDT in the 1960's led to complete destruction of Louisiana population from thinning of egg shells. (2) Decrease in nesting habitat due to erosion of barrier islands. (3) Illegal take of eggs for human consumption.

Conservation efforts: (1) Reintroduction of birds into the state from Florida (2) Annual monitoring of nesting colonies. (3) Signing of nesting colonies and protection against disturbance by man, especially during nesting season. (4) Rebuilding of islands important to nesting.



© Julia Sims

Bald Eagle

Haliaeetus leucocephalus

Federal Status: Threatened (July 12, 1995)
State Status: Endangered (December 20, 1989)

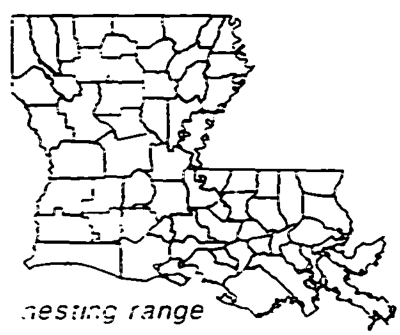
Description: Very large raptor. Adults unmistakable: dark brown body, head and tail white, large yellow bill. Immatures dark brown with pale underwing coverts and irregular light base of tail; bill black. Subadults intermediate between immatures and adults, and exhibit various amounts of white mottling on body; 4–5 years required to attain adult plumage. Wings very long, broad and rounded at the tip; primary feathers often widely separated and wings held flat when soaring. Adults to 1.1 m (3.6 ft) in length, wingspread to 2.3 m (7.5 ft). Immature Golden Eagle resembles immature Bald Eagle but has distinct white mottling on the flight feathers and well–defined band at base of tail; bill smaller. Long-lived (30–50 years). Louisiana birds nest in winter and early spring. Nests very large (up to 2.5 m [8.2 ft] across and 3.5 m [11.5 ft] deep) and used year after year. Alternate nests may be constructed by breeding pair, and the pair of birds may alternate between the two nests annually. Eggs 1–3 (usually 2). Incubation period about 35 days; young fledge 72–75 days after hatching. Feeds on self-caught or robbed fish; also consumes waterfowl, coots, muskrats and nutria.

Habitat: Nests primarily in cypress snags in swamps near open water. Feeds in open lakes.

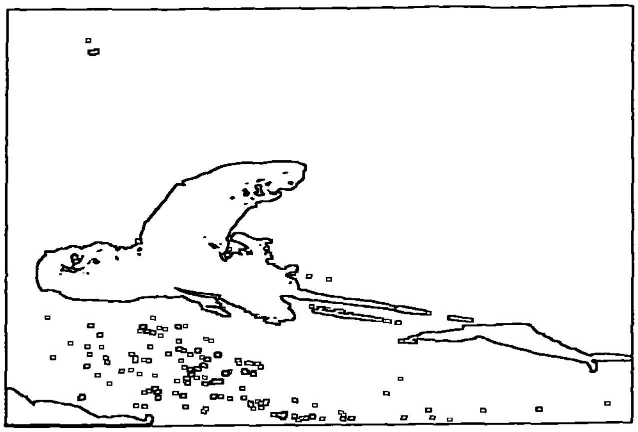
Distribution: Breeds throughout United States, southern Canada and Baja California, although rare and local away from the coast and absent from much of Great Basin and Great Plains. Winters throughout southern portion of breeding range. In Louisiana, nests primarily in southeastern coastal parishes. In winter, occasionally observed on large lakes in northern and central parishes, but nests rarely successful.

Reasons for decline: (1) Accumulation of pesticide residues (especially DDT) caused thinning of egg shells, which reduced reproductive rate; (2) loss of habitat; (3) human disturbances to nesting pairs during nesting season.

Conservation efforts: (1) Annual nesting surveys to determine productivity; (2) midwinter surveys of non–nesting birds; (3) hacking program, where newly hatched young are moved to areas with no eagles, hand reared, and released , in hope that they will return to the release site to nest; (4) protection of nest sites through Louisiana Department of Wildlife and Fisheries' Natural Areas Registry Program.



Sept. 1995



Louisiana Dept. of Wildlife & Fisheries

Kemp's Ridley Sea Turtle
Lepidochelys kempii

Federal Status: Endangered (December 2, 1970)
State Status: Endangered (December 20, 1989)

Description: This is only sea turtle with an almost circular carapace. The carapace varies in color and may be dark grey, brown, black, or olive. Distinguishing features are 2 pairs of prefrontal scales; 5 or more costal scutes, with the first pair touching the nuchal; and 4 (rarely 5) large scutes on the bridge, each with a pore on the posterior edge. Ridleys are the smallest sea turtles, weighing 36–45 kg (80-100 lb) with a carapace 50–70 cm (20-28 in) in length; large individuals may have a shell up to 75 cm (30 in) in length. Kemp's ridleys prefer sheltered areas along the coast, such as bays, bayous, and estuaries, during the non–nesting period. They are apparently mostly bottom feeders. Females lay several hundred eggs during the nesting season and may nest every year, unlike other sea turtles. Although this species does not nest in Louisiana, the estuarine and off–shore waters of Louisiana may afford key feeding and developmental sites. In addition, some of the deepwater channels and estuaries in Louisiana may provide important hibernation sites. Kemp's ridleys eat a variety of aquatic animals such as crustaceans, mollusks, fish, jellyfish, squid, and starfish.

Habitat: Warm bays and coastal waters; tidal rivers; estuaries; seagrass beds; sandy coastal beaches are used for nesting.

Distribution: Kemp's ridleys are primarily restricted to the Gulf of Mexico although juveniles may be carried in the Gulf Stream into the Atlantic as far as New England and Europe. Most nesting is restricted to a narrow stretch of beach near Rancho Nuevo, Tamaulipas, Mexico, although there are occasional nesting attempts in southern Texas and other regions in Mexico. The number of nesting females has declined from an estimated 42,000 observed on a single day in the 1940's to 621 in the entire year of 1982. This is the most endangered of the sea turtles and one of the world's most endangered vertebrates. Next to the loggerhead, this is the most commonly encountered sea turtle in Louisiana.

Reasons for decline: Intense exploitation of Kemp's ridley eggs was undoubtedly the most important cause of the decline. Of secondary importance were harvest of adults for food and incidental catch in fishing gear.

Conservation efforts: The Rancho Nuevo beach has been given full protection from disturbances. Shrimpers are now required to use turtle exclusion devises (TEDs) to reduce unintentional drownings in trawls. Additionally, a Headstart program was initiated in Galveston, Texas to hatch the eggs from Rancho Nuevo, rear the hatchlings to early juveniles, and release them in the deep Gulf waters. This program was an attempt to get the turtles to nest on the beach at Padre Island, Texas. The project has recently been stopped due to a lack of funding.

REFERENCE 29

~~88631~~

Joy Ishigo
ORIGINATOR

WESTON
PHONE CONVERSATION RECORD

CONVERSATION WITH: | **DATE:** 3/14/96

NAME: Gerald Adkins (Fishery Biologist) | **TIME:** 9:30 AM

COMPANY: Louisiana Department of Wildlife and Fisheries | X **ORIGINATOR PLACED CALL**

ADDRESS: | **ORIGINATOR RECEIVED CALL**

PHONE: (504) 594-4139 | **W.O. NO.:** 046030260310100-00

SUBJECT: Fisheries in Houma Navigation Canal and Bayou LaCarpe

---

NOTES: The area of the Canal in Houma is an industrial area, thus the fishing is limited to catfish. I asked him about crab fishing. He said that there maybe some crab fishing, but because of the traffic from the ships, the crab fishermen do not like the liability caused to them or their equipment. In the canal there is lots of fishing. The freshwater (catfish) occurs in the five mile or less from Houma (in the industrial area). Further south towards the gulf, the freshwater turns to brackish water. This is where the speckle, red, and flounder fishing occur. Also, in the freshwater area, there is bass fishing.

I asked him about the amount of fish taken from the canal. He said he really didn't know. The canal and area that I am interested in may be on a larger grid, and he would not be able to isolate the area. But, he said he would guess that in the industrial area from Houma and five miles away from there it would be about less than 1000 pounds. And, from five miles and south is would increase significantly to maybe 10,000 pounds. But, this is just a rough guess on his part.

FILE:

TICKLE FILE:

FOLLOW-UP-BY:

COPY/ROUTE TO:

FOLLOW-UP-ACTION:

REFERENCE 30

~~88634~~

WESTON

Eric Tate
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name: Dugan Sabins

Company: LDEQ

Address: Baton Rouge, LA

Phone: (504) 765-0741

Subject: Stream Use Designations

Date: 8 / 12 / 96

Time: 10:15 AM/PM

☑ Originator Placed Call

☐ Originator Received Call

W.O. NO. 4603-26-31

Notes: The following stream use designation info. is based on the Louisiana State Water Quality Regulations:

(1) Houma Navigational Canal: drinking water supply, propagation of fish & wildlife, primary & secondary contact recreation

(2) Bayou La Carpe: no listing, so it's assigned the designations of the stream for which it's a tributary (Houma Navigational Canal)

(3) Intracoastal Waterway: drinking water supply, propagation of fish & wildlife, primary & secondary contact recreation, agriculture.

(4) Bayou Black: drinking water supply, propagation of fish & wildlife, primary & secondary contact recreation.

☐ File

☐ Tickle File ___/___/___

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action: none

Originator's Initials: ECT

RFW 110-4-83

A -- primary contact recreation; B -- secondary contact recreation; C -- propagation of fish and wildlife; D -- drinking water supply; E -- oyster propagation; F -- agriculture; G -- outstanding natural resource water; L -- limited aquatic life and wildlife

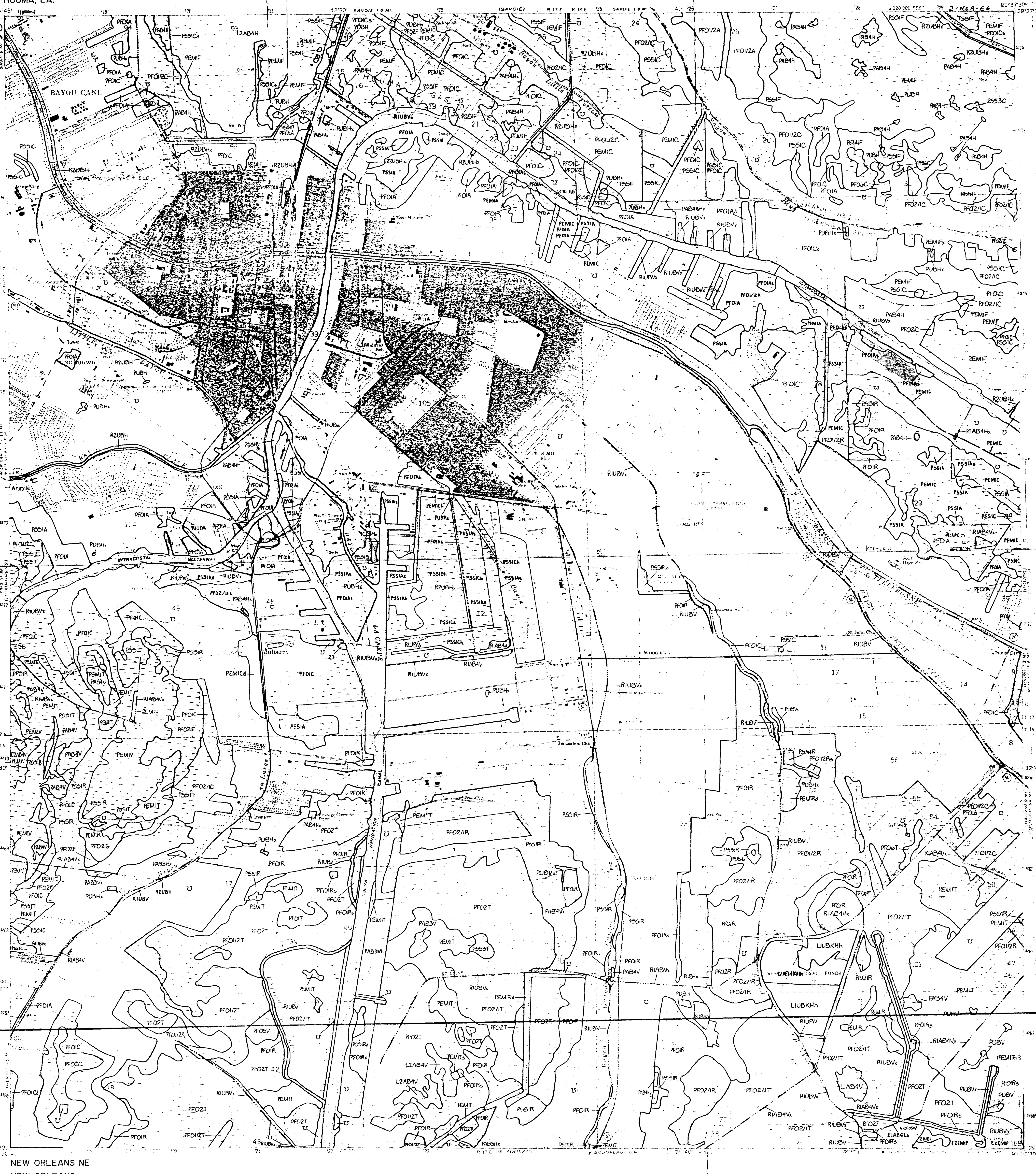
Code	Stream Description	Designated Uses
	TERREBONNE BASIN (12)	
120101	Bayou Portage	A B C
120102	Bayou Poydras	A B C
120103	Bayou Choctaw	A B C
120104	Bayou Grosse Tete	A B C
120105	Chamberlin Canal	A B C
120106	Bayou Plaquemine -- Plaquemine Lock to Intracoastal Waterway	A B C
120107	Upper Grand River and Lower Flat River -- Headwaters to Intracoastal Waterway	A B C
120108	False River	A B C
120109	Intracoastal Waterway -- Morgan City to Port Allen Route - Port Allen Locks to Bayou Sorrel Locks	A B C
120110	Bayou Cholpe -- Headwaters to Bayou Choctaw	A B C
120111	Bayou Maringouin -- Headwaters to East Atchafalaya Basin Levee	A B C
120112	Bayou Fordoche -- Headwaters near Morganza to Bayou Grosse Tete	A B C
120201	Lower Grand River and Belle River -- Bayou Sorrel Lock to Lake Palourde (includes Bay Natchez, Lake Natchez, Bayou Milhomme, and Bayou Long)	A B C
120202	**Bayou Black -- Intracoastal Waterway to Houma**	**A B C D**
120203	Bayou Boeuf -- Lake Palourde to boundary between segments 1202 and 1204	A B C D
120204	Lake Verret and Grassy Lake	A B C
120205	Lake Palourde	A B C D
120206	Grand Bayou & Little Grand Bayou -- Headwaters to Lake Verret	A B C
120207	Thibodaux Swamp (Pointe Au Chene Swamp) -- Forested wetland in Lafourche and Terrebonne Parishes, 6.2 miles (10 km) southwest of Thibodaux, La., east of Terrebonne-Lafourche Drainage Canal, and north of Southern Pacific Railroad	B C
120301	Bayou Terrebonne -- Thibodaux to boundary between segments 1203 and 1206, at Houma	A B C
120302	Company Canal -- from Bayou Lafourche to intercoastal Waterway	A B C D F
120303	Lake Long	A B C
120304	**Intracoastal Waterway -- Houma to Larose**	**A B C D F**
120401	Bayou Penchant -- Bayou Chene to Lake Penchant	A B C G
120402	Bayou Chene -- From Intracoastal Waterway to Bayou Penchant	A B C
120403	Intracoastal Waterway -- Bayou Boeuf Locks to boundary between segments 1204 and 1203, at Houma (includes segments of Bayous Boeuf, Black and Chene)	A B C D F
120404	Lake Penchant	A B C
120405	Lake Hache, Lake Theriot	A B C

120406	Lake de Cade	A B C E	
120501	Bayou Grand Caillou -- Houma to Bayou Pelton	A B C	
120502	Bayou Grand Caillou -- from Bayou Pelton to the boundary between segments 1205 and 1207 (Estuarine)	A B C E	
120503	Bayou Petit Caillou -- from Bayou Terrebonne to Klondyke Road Bridge	A B C E	
120504	Bayou Petit Caillou -- Klondyke Road Bridge to boundary between segments 1205 and 1207 (Estuarine)	A B C E	
120505	Bayou Du Large -- from Houma to Marmande Canal between segments 1205 and 1207 (Estuarine)	A B C	
120506	Bayou Du Large -- Marmande Canal to the boundary between segments 1205 and 1207 (Estuarine)	A B C E	
120507	Bayou Chauvin -- Ashland Canal to Lake Boudreaux	A B C	
120508	Houma Navigation Canal - Bayou Pelton to the boundary between segments 1205 and 1207 (Estuarine)	A B C E	
120509	**Houma Navigation Canal -- Houma to Bayou Pelton**	**A B C D**	
120601	Bayou Terrebonne -- Houma to Company Canal	A B C	
120602	Bayou Terrebonne -- from Company Canal to Humble Canal (Estuarine)	A B C E	5
120603	Company Canal -- from Intracoastal Waterway to Bayou Terrebonne	A B C	
120604	Bayou Blue -- Intracoastal Waterway to boundary between segments 1206 and 1207	A B C	
120605	Bayou Pointe Au Chien -- Source to boundary between segments 1206 and 1207	A B C	
120606	Bayou Blue -- Grand Bayou Canal to boundary between segments 1206 and 1207 (Estuarine)	A B C	5
120701	Bayou Grand Caillou -- boundary between segments 1205 and 1207 to Caillou Bay (Estuarine)	A B C E	
120702	Bayou Petit Caillou -- from boundary between segments 1205 and 1207 to Houma Navigation Canal (Estuarine)	A B C E	
120703	Bayou Du Large -- from the boundary between segments 1205 and 1207 to Caillou Bay (Estuarine)	A B C E	
120704	Bayou Terrebonne -- from Humble Canal to Lake Barre (Estuarine)	A B C E	
120705	Houma Navigation Canal -- from the segment boundary between 1205 and 1207 to Terrebonne Bay (Estuarine)	A B C E	
120706	Bayou Blue -- Boundary between segments 1206 and 1207 to Lake Raccourci (Estuarine)	A B C E	
120707	Lake Boudreaux	A B C E	
120708	Lost Lake, Four League Bay	A B C E	
120709	Bayou Petite Caillou -- from Houme Navigation Canal to Terrebonne Bay	A B C E	
120801	Caillou Bay	A B C E	
120802	Terrebonne Bay	A B C E	
120803	Timbalier Bay	A B C E	
120804	Lake Barre	A B C E	
120805	Lake Pelto	A B C E	
120806	Terrebonne Basin Coastal Bays and Gulf Waters to the State three-mile Limit	A B C E	

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

HOUMA, LA.



NEW ORLEANS NE
NEW ORLEANS

HOUMA, LA.

SCALE 1:24 000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

1 acre 10 acres 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

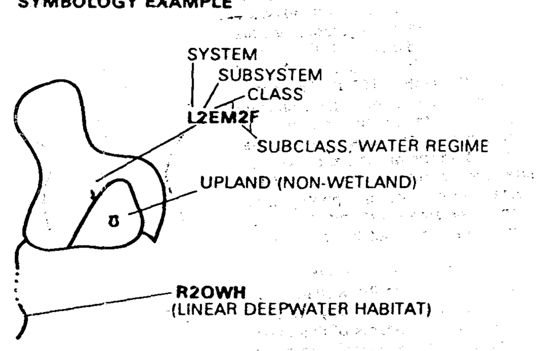
Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States (FWS/OBS - 79/31 December 1979)**. The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. **Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.**

SYMBOLOGY EXAMPLE



Ʊ — Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

AERIAL PHOTOGRAPHY

DATE: 1 / / 89 DATE: / /
SCALE: 1:65 000 SCALE:
TYPE: CIR TYPE:

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

1991

SYSTEM: M — MARINE

SUBSYSTEM: 1 — SUBTIDAL
- CLASS: RB — ROCK BOTTOM — Subclass: 1 Bedrock, 2 Rubble
- CLASS: UB — UNCONSOLIDATED BOTTOM — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
- CLASS: RF — REEF — Subclass: 1 Coral, 3 Worm
- CLASS: OW — *OPEN WATER/Unknown Bottom*

SUBSYSTEM: 2 — INTERTIDAL
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
- CLASS: RF — REEF — Subclass: 1 Coral, 3 Worm
- CLASS: RS — ROCKY SHORE — Subclass: 1 Bedrock, 2 Rubble
- CLASS: US — UNCONSOLIDATED SHORE — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

SYSTEM: E — ESTUARINE

SUBSYSTEM: 1 — SUBTIDAL
- CLASS: RB — ROCK BOTTOM — Subclass: 1 Bedrock, 2 Rubble
- CLASS: UB — UNCONSOLIDATED BOTTOM — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- CLASS: RF — REEF — Subclass: 2 Mollusc, 3 Worm
- CLASS: OW — *OPEN WATER/Unknown Bottom*

SUBSYSTEM: 2 — INTERTIDAL
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- CLASS: RF — REEF — Subclass: 2 Mollusc, 3 Worm
- CLASS: SB — STREAMBED — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: RS — ROCKY SHORE — Subclass: 1 Bedrock, 2 Rubble
- CLASS: US — UNCONSOLIDATED SHORE — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: EM — EMERGENT — Subclass: 1 Persistent, 2 Nonpersistent
- CLASS: SS — SCRUB-SHRUB — Subclass: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- CLASS: FO — FORESTED — Subclass: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

SYSTEM: R — RIVERINE

SUBSYSTEM: 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — UNKNOWN PERENNIAL
- CLASS: RB — ROCK — Subclass: 1 Bedrock, 2 Rubble
- CLASS: UB — UNCONSOLIDATED BOTTOM — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: *SB — STREAMBED — Subclass: 1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- CLASS: RS — ROCKY SHORE — Subclass: 1 Bedrock, 2 Rubble
- CLASS: US — UNCONSOLIDATED SHORE — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- CLASS: **EM — EMERGENT — Subclass: 2 Nonpersistent
- CLASS: OW — *OPEN WATER/Unknown Bottom*

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM

**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS

SYSTEM: L — LACUSTRINE

SUBSYSTEM: 1 — LIMNETIC
- CLASS: RB — ROCK BOTTOM — Subclass: 1 Bedrock, 2 Rubble
- CLASS: UB — UNCONSOLIDATED BOTTOM — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- CLASS: OW — *OPEN WATER/Unknown Bottom*

SUBSYSTEM: 2 — LITTORAL
- CLASS: RB — ROCK BOTTOM — Subclass: 1 Bedrock, 2 Rubble
- CLASS: UB — UNCONSOLIDATED BOTTOM — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- CLASS: RS — ROCKY SHORE — Subclass: 1 Bedrock, 2 Rubble
- CLASS: US — UNCONSOLIDATED SHORE — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- CLASS: EM — EMERGENT — Subclass: 2 Nonpersistent
- CLASS: OW — *OPEN WATER/Unknown Bottom*

SYSTEM: P — PALUSTRINE
- CLASS: RB — ROCK BOTTOM — Subclass: 1 Bedrock, 2 Rubble
- CLASS: UB — UNCONSOLIDATED BOTTOM — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- CLASS: AB — AQUATIC BED — Subclass: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- CLASS: US — UNCONSOLIDATED SHORE — Subclass: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- CLASS: ML — MOSS-LICHEN — Subclass: 1 Moss, 2 Lichen
- CLASS: EM — EMERGENT — Subclass: 1 Persistent, 2 Nonpersistent
- CLASS: SS — SCRUB-SHRUB — Subclass: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- CLASS: FO — FORESTED — Subclass: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- CLASS: OW — *OPEN WATER/Unknown Bottom*

MODIFIERS

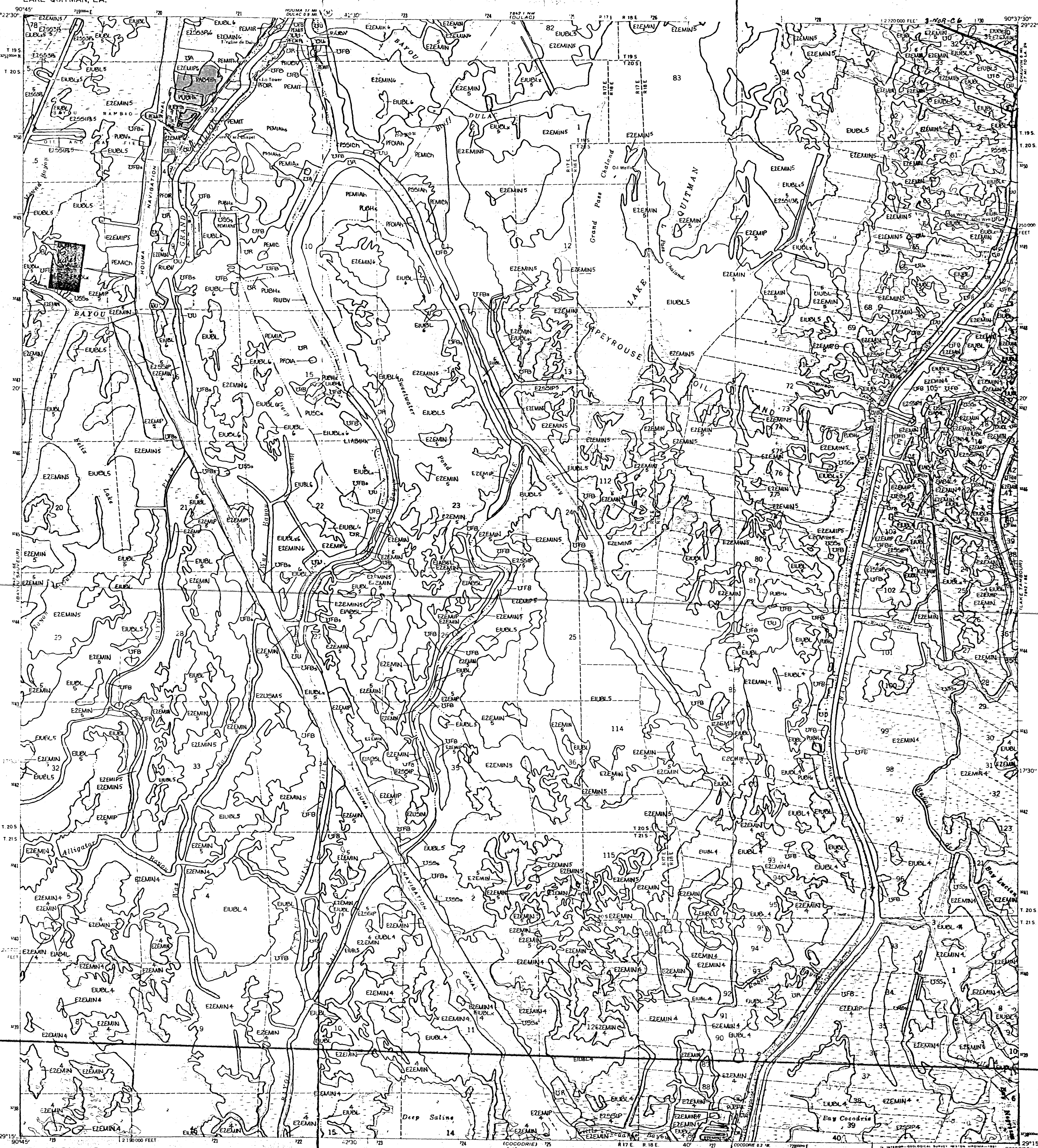
In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME: Non-Tidal		WATER REGIME: Tidal		WATER CHEMISTRY: Coastal Halinity	WATER CHEMISTRY: Inland Salinity	WATER CHEMISTRY: pH Modifiers for all Fresh Water	SOIL	SPECIAL MODIFIERS	
A Temporarily Flooded	H Permanently Flooded	K *Artificially Flooded*	*S Temporary-Tidal	1 Hyperhaline	7 Hypersaline	a Acid	g Organic	b *Beaver*	h *Diked/Impounded*
B Saturated	J Intermittently Flooded	L Subtidal	*R Seasonal-Tidal	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral	d *Partially Drained/Ditched*	r Artificial Substrate
C Seasonally Flooded	K Artificially Flooded	M Irregularly Exposed	*T Semipermanent-Tidal	3 Mixohaline *(Brackish)*	9 Mixosaline	i Alkaline		f Farmed	s *Spoil*
D *Seasonally Flooded/Well Drained*	W Intermittently Flooded/Temporary	N Regularly Flooded	*V Permanent-Tidal	4 Polyhaline	0 Fresh				x Excavated
E *Seasonally Flooded/Saturated*	Y Saturated/Semipermanent/Seasonal	P Irregularly Flooded	U *Unknown*	5 Mesohaline					
F Semipermanently Flooded	Z Intermittently Exposed/Permanent			6 Oligohaline					
G Intermittently Exposed	U *Unknown*			0 Fresh					

*These water regimes are only used in tidally influenced, freshwater systems.

LAKE QUITMAN, LA.

LAKE QUITMAN, LA.



NEW ORLEANS SE
TERREBONNE BAY

LAKE QUITMAN, LA.

SCALE 1:24000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

1 acre | 10 acres | 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

UPLAND LEGEND

UPLAND CLASSES	MODIFYING TERMS
U-Urban or Developed	o-oil and/or gas
A-Agricultural	r-rice field
F-Forest	6-deciduous 7-evergreen 8-mixed
SS-Scrub-Shrub	p-park
R-Range	s-spoil d-dune
B-Barren	t-transportation

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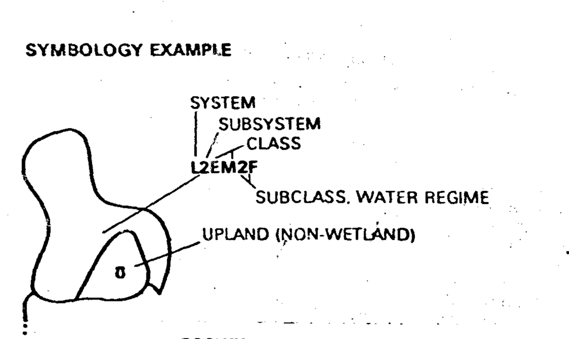

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DATE:	1 / 89	11 / 88
SCALE:	1:65 000	1:65 000
TYPE:	CIR	CIR

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
For
NATIONAL WETLANDS RESEARCH CENTER
1991

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

M — MARINE

SUBSYSTEM: 1 — SUBTIDAL
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
- RF — REEF: 1 Coral, 3 Worm
- OW — *OPEN WATER/Unknown Bottom*

SUBSYSTEM: 2 — INTERTIDAL
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
- RF — REEF: 1 Coral, 3 Worm
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

E — ESTUARINE

SUBSYSTEM: 1 — SUBTIDAL
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RF — REEF: 2 Mollusc, 3 Worm
- OW — *OPEN WATER/Unknown Bottom*

SUBSYSTEM: 2 — INTERTIDAL
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RF — REEF: 2 Mollusc, 3 Worm
- SB — STREAMBED: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- EM — EMERGENT: 1 Persistent, 2 Nonpersistent
- SS — SCRUB-SHRUB: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- FO — FORESTED: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

R — RIVERINE

SUBSYSTEM: 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — UNKNOWN PERENNIAL
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- *SB — STREAMBED: 1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- **EM — EMERGENT: 2 Nonpersistent
- OW — *OPEN WATER/Unknown Bottom*

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**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

L — LACUSTRINE

SUBSYSTEM: 1 — LIMNETIC
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- OW — *OPEN WATER/Unknown Bottom*

SUBSYSTEM: 2 — LITTORAL
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- EM — EMERGENT: 2 Nonpersistent
- OW — *OPEN WATER/Unknown Bottom*

P — PALUSTRINE

- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- ML — MOSS-LICHEN: 1 Moss, 2 Lichen
- EM — EMERGENT: 1 Persistent, 2 Nonpersistent
- SS — SCRUB-SHRUB: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
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- OW — *OPEN WATER/Unknown Bottom*

MODIFIERS

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WATER REGIME

Non-Tidal: A Temporarily Flooded; B Saturated; C Seasonally Flooded; D *Seasonally Flooded/Well Drained*; E *Seasonally Flooded/Saturated*; F Semipermanently Flooded; G Intermittently Exposed; H Permanently Flooded; J Intermittently Flooded; K Artificially Flooded; W Intermittently Flooded/Temporary; Y Saturated/Semipermanent/Seasonal; Z Intermittently Exposed/Permanent; U *Unknown*

Tidal: K *Artificially Flooded*; L Subtidal; M Irregularly Exposed; N Regularly Flooded; P Irregularly Flooded; *S Temporary-Tidal; *R Seasonal-Tidal; *T Semipermanent-Tidal; *V Permanent-Tidal; U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity: 1 Hyperhaline; 2 Euhaline; 3 Mixohaline (*Brackish*); 4 Polyhaline; 5 Mesohaline; 6 Oligohaline; 0 Fresh

Inland Salinity: 7 Hypersaline; 8 Eusaline; 9 Mixosaline; 0 Fresh

pH Modifiers for all Fresh Water: a Acid; t Circumneutral; i Alkaline

SOIL

g Organic; n Mineral

SPECIAL MODIFIERS

b *Beaver*; d *Partially Drained/Ditched*; f Farmed; h *Diked/Impounded*; r Artificial Substrate; s *Spoil*; x Excavated

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

DULAC, LA.

NEW ORLEANS SE
TERREBONNE BAY

DULAC, LA.

SCALE 1:24000

1 — ½ — 0 — 1 MILE

1000 — 0 — 1000 — 2000 — 3000 — 4000 — 5000 — 6000 — 7000 FEET

1 — .5 — 0 — 1 KILOMETER

1 acre | 5 acres | 10 acres | 20 acres | 40 acres

ACREAGE GUIDE

For information on availability of NWI maps, call 1-800-USA-MAPS.

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
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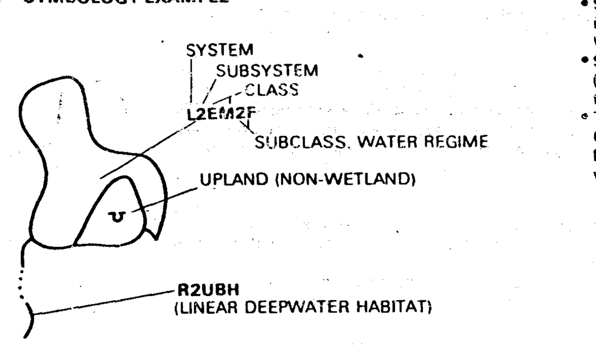

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AERIAL PHOTOGRAPHY

DATE: 1 / / 89 — DATE: / /
SCALE: 1:65 000 — SCALE:
TYPE: CIR — TYPE:

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
1992

SYSTEM: M — MARINE

SUBSYSTEM: 1 — SUBTIDAL

- CLASS RB — ROCK BOTTOM. Subclass: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
- RF — REEF: 1 Coral, 3 Worm
- OW — *OPEN WATER/ Unknown Bottom*

SUBSYSTEM: 2 — INTERTIDAL

- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
- RF — REEF: 1 Coral, 3 Worm
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

SYSTEM: E — ESTUARINE

SUBSYSTEM: 1 — SUBTIDAL

- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RF — REEF: 2 Mollusc, 3 Worm
- OW — *OPEN WATER/ Unknown Bottom*

SUBSYSTEM: 2 — INTERTIDAL

- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RF — REEF: 2 Mollusc, 3 Worm
- SB — STREAMBED: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
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SYSTEM: R — RIVERINE

SUBSYSTEM: 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — *UNKNOWN PERENNIAL*

- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
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- **EM — EMERGENT: 2 Nonpersistent
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- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- EM — EMERGENT: 2 Nonpersistent
- OW — *OPEN WATER/ Unknown Bottom*

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- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
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- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal:
- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

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WATER CHEMISTRY

Coastal Halinity:
- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity:
- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water:
- a Acid
- t Circumneutral
- i Alkaline

SOIL
- g Organic
- n Mineral

SPECIAL MODIFIERS
- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

LAROSE, LA.

NEW ORLEANS NE
NEW ORLEANS

LAROSE, LA.

SCALE 1:24 000

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

MILE

KILOMETER

1 acre 10 acres 20 acres

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SYMBOLOGY EXAMPLE

SYSTEM
SUBSYSTEM
CLASS
L2EM2F
SUBCLASS, WATER REGIME
UPLAND (NON-WETLAND)
R2OWH
(LINEAR DEEPWATER HABITAT)

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75 Spring Street S.W.
Atlanta, Georgia 30303

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- OW — *OPEN WATER/ Unknown Bottom*

SUBSYSTEM 2 — INTERTIDAL
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
- RF — REEF: 1 Coral, 3 Worm
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

E — ESTUARINE

SUBSYSTEM 1 — SUBTIDAL
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
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- RF — REEF: 2 Mollusc, 3 Worm
- OW — *OPEN WATER/ Unknown Bottom*

SUBSYSTEM 2 — INTERTIDAL
- AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
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- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- EM — EMERGENT: 1 Persistent, 2 Nonpersistent
- SS — SCRUB-SHRUB: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- FO — FORESTED: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

R — RIVERINE

SUBSYSTEM: 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — UNKNOWN PERENNIAL

- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- *SB — STREAMBED: 1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- **EM — EMERGENT: 2 Nonpersistent
- OW — *OPEN WATER/ Unknown Bottom*

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

L — LACUSTRINE

SUBSYSTEM 1 — LIMNETIC
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- OW — *OPEN WATER/ Unknown Bottom*

SUBSYSTEM 2 — LITTORAL
- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- EM — EMERGENT: 2 Nonpersistent
- OW — *OPEN WATER/ Unknown Bottom*

P — PALUSTRINE

- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- ML — MOSS-LICHEN: 1 Moss, 2 Lichen
- EM — EMERGENT: 1 Persistent, 2 Nonpersistent
- SS — SCRUB-SHRUB: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- FO — FORESTED: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- OW — *OPEN WATER/ Unknown Bottom*

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal
- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal
- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity
- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity
- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water
- a Acid
- t Circumneutral
- i Alkaline

SOIL
- g Organic
- n Mineral

SPECIAL MODIFIERS
- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

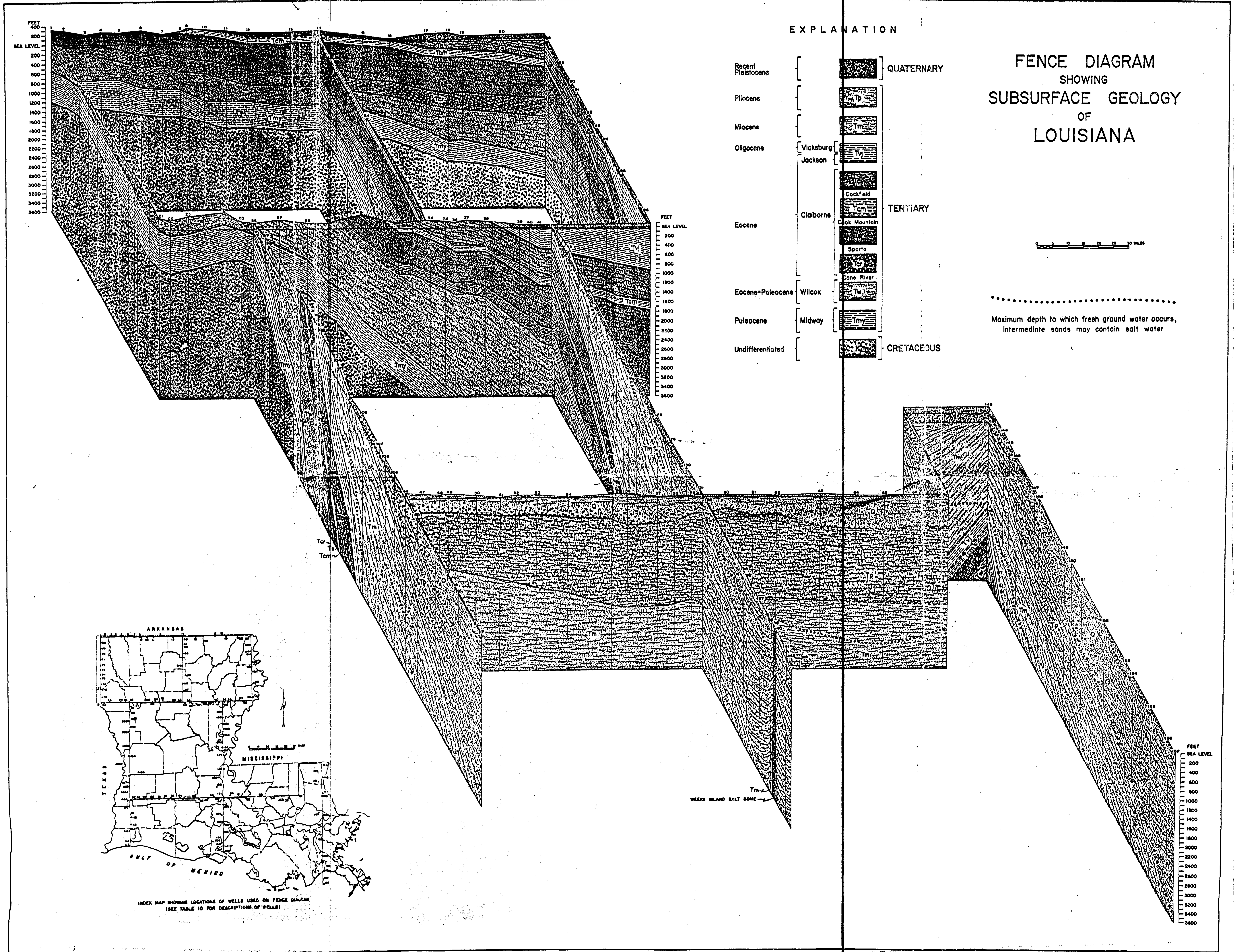

PLATE 2. LA. WATER RESOURCES BULL. NO.1

REFERENCE 31

~~88637~~

U.S. Department of Commerce
Economics and Statistics Administration
BUREAU OF THE CENSUS

CENSUS '90

1990 CPH-1-20

1990 Census of Population and Housing

Summary Population and Housing Characteristics

Louisiana

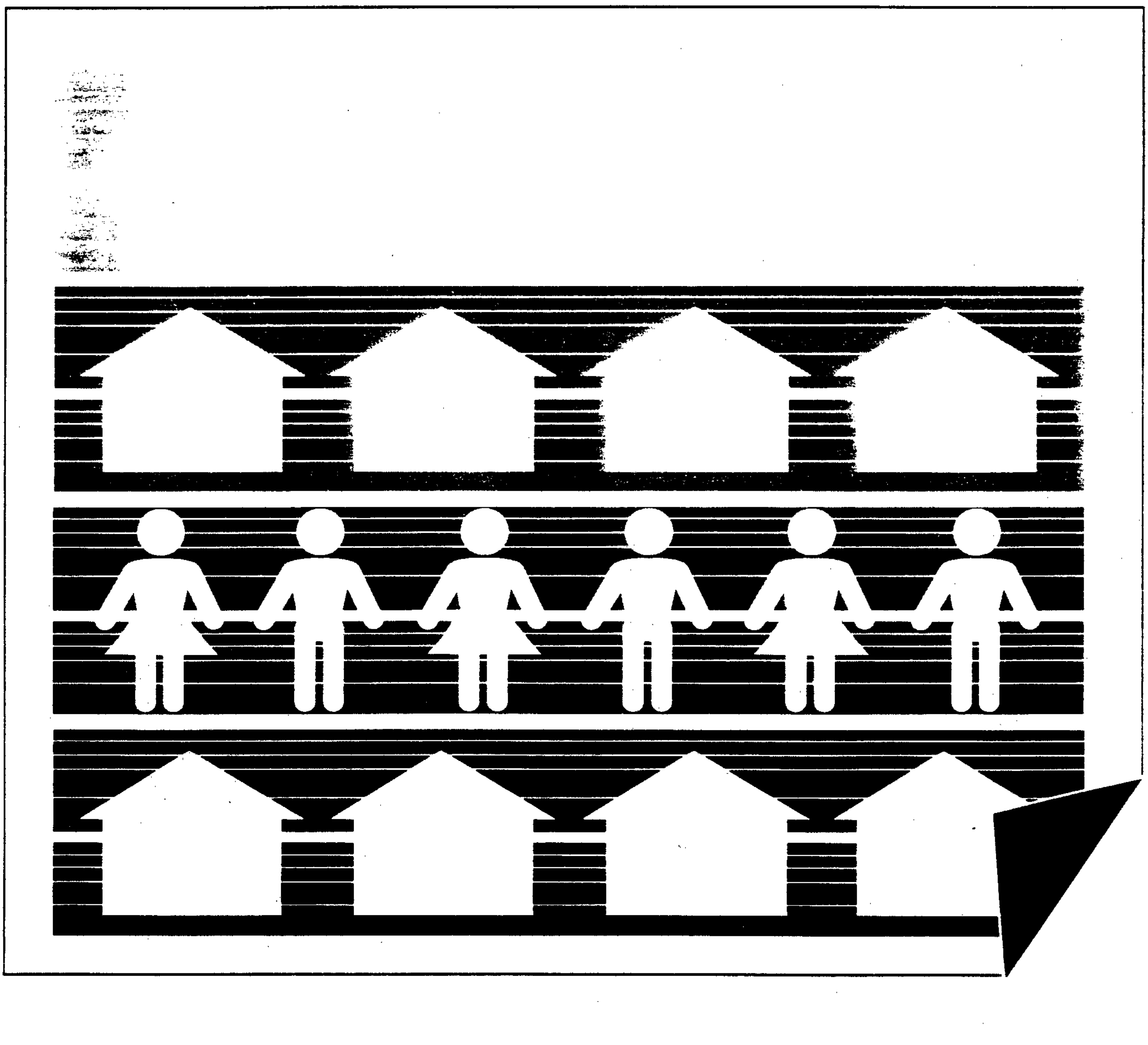

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Table 6. Household, Family, and Group Quarters Characteristics: 1990—Con.

[For definitions of terms and meanings of symbols, see text]

State Parish Place	Persons in households	All households	Family households			Nonfamily households				Persons per—		Persons in group quarters		
							Householder living alone							
								65 years and over						
			Total	Married-couple family	Female householder, no husband present	Total	Total	Total	Female	Household	Family	Total	Institutionalized persons	Other persons in group quarters
PLACE—Con.														
Eden Isle CDP, St. Tammany Parish	3 768	1 668	1 085	946	94	583	463	49	28	2.26	2.77	–	–	–
Edgard CDP, St. John the Baptist Parish	2 753	814	666	417	194	148	138	62	34	3.38	3.86	–	–	–
Edgefield village, Red River Parish	207	77	65	55	9	12	12	7	6	2.69	2.98	–	–	–
Elizabeth town, Allen Parish	414	145	128	103	20	17	17	9	5	2.86	3.07	–	–	–
Elton town, Jefferson Davis Parish	1 277	488	338	260	65	150	139	85	68	2.62	3.24	–	–	–
Empire CDP, Plaquemines Parish	2 654	860	660	498	116	200	174	66	40	3.09	3.57	–	–	–
Epps village, West Carroll Parish	541	186	138	94	38	48	45	26	21	2.91	3.46	–	–	–
Erath town, Vermilion Parish	2 301	854	631	477	125	223	208	127	100	2.69	3.21	127	127	–
Eros town, Jackson Parish	177	68	49	45	4	19	17	7	5	2.60	3.14	–	–	–
Estelle CDP, Jefferson Parish	14 091	4 114	3 623	3 029	440	491	396	69	49	3.43	3.66	–	–	–
Estherwood village, Acadia Parish	745	267	201	159	35	66	54	31	24	2.79	3.29	–	–	–
Eunice city	10 949	3 989	2 899	2 109	646	1 090	1 008	527	426	2.74	3.32	213	200	13
Acadia Parish	232	74	64	56	6	10	10	4	4	3.14	3.45	–	–	–
St. Landry Parish	10 717	3 915	2 835	2 053	640	1 080	998	523	422	2.74	3.31	213	200	13
Evergreen town, Avoyelles Parish	283	101	81	61	15	20	19	10	8	2.80	3.21	–	–	–
Farmerville town, Union Parish	3 099	1 191	846	555	271	345	323	161	129	2.60	3.18	235	235	–
Fenton village, Jefferson Davis Parish	265	96	75	63	9	21	21	12	10	2.76	3.21	–	–	–
Ferriday town, Concordia Parish	3 924	1 417	1 014	465	482	403	371	201	161	2.77	3.36	187	187	–
Fisher village, Sabine Parish	277	89	70	57	8	19	17	12	9	3.11	3.63	–	–	–
Florien village, Sabine Parish	626	227	174	120	48	53	52	36	32	2.76	3.25	–	–	–
Folsom village, St. Tammany Parish	469	164	131	104	21	33	28	14	12	2.86	3.27	–	–	–
Fordoche village, Pointe Coupee Parish	869	292	247	208	29	45	38	24	20	2.98	3.25	–	–	–
Forest village, West Carroll Parish	263	99	75	67	7	24	23	15	13	2.66	3.15	–	–	–
Forest Hill village, Rapides Parish	408	159	114	96	9	45	42	27	20	2.57	3.04	–	–	–
Fort Polk North CDP, Vernon Parish	3 641	1 129	1 101	1 039	55	28	27	–	–	3.22	3.24	178	–	178
Fort Polk South CDP, Vernon Parish	10 665	2 963	2 880	2 707	129	83	73	–	–	3.60	3.63	246	–	246
Franklin city, St. Mary Parish	8 753	3 060	2 288	1 580	595	772	691	330	268	2.86	3.38	251	246	5
Franklinton town, Washington Parish	3 729	1 361	974	611	317	387	364	201	157	2.74	3.33	278	278	–
French Settlement village, Livingston Parish	829	305	243	209	18	62	56	26	21	2.72	3.08	–	–	–
Galliano CDP, Lafourche Parish	4 294	1 504	1 208	1 028	128	296	254	116	98	2.86	3.23	–	–	–
Gardere CDP, East Baton Rouge Parish	7 190	2 905	1 654	1 101	435	1 251	720	11	10	2.48	3.09	19	–	19
Garyville CDP, St. John the Baptist Parish	3 181	972	762	490	235	210	192	92	65	3.27	3.83	–	–	–
Georgetown village, Grant Parish	273	115	74	60	13	41	37	26	22	2.37	3.04	–	–	–
Gibsland town, Bienville Parish	1 224	496	338	203	115	158	152	81	57	2.47	3.09	–	–	–
Gilbert village, Franklin Parish	704	246	187	125	53	59	56	38	30	2.86	3.37	–	–	–
Gilliam village, Caddo Parish	202	74	46	40	4	28	25	8	6	2.73	3.65	–	–	–
Glenmora town, Rapides Parish	1 686	635	453	309	125	182	171	113	83	2.66	3.24	–	–	–
Golden Meadow town, Lafourche Parish	2 049	777	595	477	82	182	161	78	66	2.64	3.05	–	–	–
Goldonna village, Natchitoches Parish	417	154	118	107	8	36	36	22	18	2.71	3.20	–	–	–
Gonzales city, Ascension Parish	6 979	2 529	1 919	1 478	348	610	527	157	130	2.76	3.22	24	1	23
Grambling town, Lincoln Parish	2 693	1 029	700	374	301	329	249	83	63	2.62	3.19	2 791	–	2 791
Gramercy town, St. James Parish	2 412	810	666	543	96	144	136	72	58	2.98	3.37	–	–	–
Grand Cane village, De Soto Parish	233	98	70	52	11	28	28	18	12	2.38	2.90	–	–	–
Grand Coteau town, St. Landry Parish	1 046	360	266	159	94	94	82	41	34	2.91	3.47	72	–	72
Grand Isle town, Jefferson Parish	1 444	528	391	315	46	137	118	45	33	2.73	3.21	11	–	11
Gray CDP, Terrebonne Parish	4 260	1 372	1 095	817	222	277	213	56	43	3.10	3.52	–	–	–
Grayson village, Caldwell Parish	529	215	158	115	38	57	52	38	29	2.46	2.92	–	–	–
Greensburg town, St. Helena Parish	489	179	129	100	22	50	47	26	24	2.73	3.35	94	94	–
Greenwood town, Caddo Parish	2 092	800	590	483	91	210	191	48	34	2.62	3.13	–	–	–
Gretna city, Jefferson Parish	16 440	6 616	4 320	2 745	1 267	2 296	2 015	761	554	2.48	3.13	768	768	–
Grosse Tete village, Iberville Parish	541	191	143	94	41	48	43	18	14	2.83	3.34	–	–	–
Gueydan town, Vermilion Parish	1 611	666	440	335	87	226	209	116	97	2.42	3.04	–	–	–
Hackberry CDP, Cameron Parish	1 664	583	465	404	41	118	100	38	29	2.85	3.25	–	–	–
Hahnville CDP, St. Charles Parish	2 536	883	669	440	203	214	190	63	58	2.87	3.37	63	63	–
Hall Summit village, Red River Parish	227	96	72	62	10	24	24	16	10	2.36	2.82	–	–	–
Hammond city, Tangipahoa Parish	14 129	5 413	3 309	1 982	1 156	2 104	1 595	512	398	2.61	3.35	1 742	358	1 384
Harahan city, Jefferson Parish	9 925	3 839	2 911	2 367	418	928	803	380	303	2.59	3.00	2	2	–
Harrisonburg village, Catahoula Parish	342	136	96	65	24	40	38	27	23	2.51	3.09	111	111	–
Harvey CDP, Jefferson Parish	20 983	7 462	5 415	3 722	1 303	2 047	1 735	453	341	2.81	3.35	239	218	21
Haughton town, Bossier Parish	1 664	597	467	378	71	130	120	54	39	2.79	3.22	–	–	–
Haynesville town, Claiborne Parish	2 816	1 123	769	560	176	354	340	225	186	2.51	3.15	38	38	–
Heflin village, Webster Parish	253	93	72	61	9	21	20	11	10	2.72	3.14	–	–	–
Henderson town, St. Martin Parish	1 543	508	394	312	51	114	101	47	40	3.04	3.50	–	–	–
Hessmer village, Avoyelles Parish	578	212	160	134	23	52	49	29	20	2.73	3.24	–	–	–
Hodge village, Jackson Parish	562	244	164	128	27	80	79	40	35	2.30	2.91	–	–	–
Homer town, Claiborne Parish	4 111	1 549	1 050	665	321	499	471	280	234	2.65	3.34	41	41	–
Hornbeck town, Vernon Parish	427	177	116	98	14	61	60	35	29	2.41	3.10	–	–	–
Hosston village, Caddo Parish	417	157	119	86	23	38	38	18	14	2.66	3.12	–	–	–
Houma city, Terrebonne Parish	30 080	10 658	7 939	5 722	1 784	2 719	2 361	1 110	893	2.82	3.33	415	342	73
Ida village, Caddo Parish	250	105	78	70	7	27	26	20	15	2.38	2.82	–	–	–
Independence town, Tangipahoa Parish	1 632	640	443	296	127	197	186	106	83	2.55	3.16	–	–	–
Inniswold CDP, East Baton Rouge Parish	3 469	1 406	989	821	132	417	347	62	50	2.47	2.98	5	5	–
Iota town, Acadia Parish	1 256	482	344	255	73	138	123	74	59	2.61	3.16	–	–	–
Iowa town, Calcasieu Parish	2 588	872	702	562	118	170	157	82	68	2.97	3.37	–	–	–
Jackson town, East Feliciana Parish	2 120	800	577	399	154	223	211	96	81	2.65	3.22	1 771	1 771	–
Jamestown village, Bienville Parish	148	56	44	36	7	12	12	9	8	2.64	3.05	–	–	–
Jeanerette city, Iberia Parish	6 205	2 019	1 582	1 008	480	437	398	212	161	3.07	3.55	–	–	–
Jean Lafitte town, Jefferson Parish	1 469	492	396	333	48	96	82	39	25	2.99	3.35	–	–	–
Jefferson CDP, Jefferson Parish	14 112	6 796	3 641	2 629	787	3 155	2 708	850	652	2.08	2.83	409	273	136
Jena town, La Salle Parish	2 523	1 044	725	606	96	319	304	176	145	2.42	3.00	103	103	–
Jennings city, Jefferson Davis Parish	10 975	3 999	2 963	2 183	641	1 036	947	507	408	2.74	3.27	330	330	–
Jonesboro town, Jackson Parish	4 148	1 692	1 116	757	306	576	548	335	274	2.45	3.12	157	157	–
Jonesville town, Catahoula Parish	2 661	929	665	383	231	264	247	129	103	2.86	3.49	59	59	–
Junction City village	749	268	210	147	57	58	54	28	24	2.79	3.23	–	–	–
Claiborne Parish	105	41	35	30	4	6	5	1	1	2.56	2.80	–	–	–
Union Parish	644	227	175	117	53	52	49	27	23	2.84	3.31	–	–	–
Kaplan city, Vermilion Parish	4 415	1 772	1 217	913	244	555	501	326	259	2.49	3.06	120	120	–
Keachi town, De Soto Parish	277	107	74	59	13	33	29	17	11	2.59	3.18	–	–	–
Kenner city, Jefferson Parish	71 442	25 056	18 614	14 136	3 499	6 442	5 459	1 091	878	2.85	3.37	591	573	18
Kentwood town, Tangipahoa Parish	2 343	865	592	342	226	273	262	160	120	2.71	3.45	125	125	–
Kilbourne village, West Carroll Parish	409	162	123	104	13	39	39	23	21	2.52	2.93	–	–	–
Killian village, Livingston Parish	721	267	203	174	20	64	58	27	18	2.70	3.17	–	–	–
Kinder town, Allen Parish	2 148	812	588	422	143	224	211	122	107	2.65	3.20	98	98	–
Krotz Springs town, St. Landry Parish	1 285	460	371	301	58	89	78	40	26	2.79	3.15	–	–	–
Labadieville CDP, Assumption Parish	1 821	629	495	404	75	134	126	64	51	2.90	3.33	–	–	–

[For definitions of terms and meanings of symbols, see text]

State Parish Parish Subdivision Place	All persons	Land area		Persons per—	
		Square kilometers	Square miles	Square kilometer	Square mile
St. Tammany Parish—Con.					
District 10	8 173	36.0	13.9	227.0	588.0
Slidell city (pt.)	5 030	5 1	2.0	986.3	2 515.0
District 11	12 036	118.3	45 7	101 7	263.4
Lacombe CDP (pt.)	488	2.3	9	212.2	542.2
Slidell city (pt.)	269	1.5	.6	179.3	448.3
District 12	6 514	7.2	2.8	904.7	2 326.4
Slidell city (pt.)	6 488	7.1	2.7	913.8	2 403.0
District 13	13 554	215.4	83.1	62.9	163.1
Eden Isle CDP	3 768	9.5	3.7	396.6	1 018.4
Slidell city (pt.)	114	9	4	126.7	285.0
District 14	6 923	18.7	7.2	370.2	961.5
Slidell city (pt.)	2 602	2.9	1.1	897.2	2 365.5
Tangipahoa Parish	85 709	2 046.9	790.3	41.9	108.5
District 1	6 552	292.1	112.8	22.4	58.1
Kentwood town	2 468	17.9	6.9	137.9	357.7
Tangipahoa village	569	2.4	.9	237.1	632.2
District 2	7 032	389.9	150.6	18.0	46.7
Amite City town (pt.)	1 581	4.7	1.8	336.4	878.3
Roseland town	1 093	5.5	2.1	198.7	520.5
District 3	7 527	102.5	39.6	73.4	190.1
Amite City town (pt.)	2 655	3.0	1.2	885.0	2 212.5
Independence town (pt.)	490	1.8	.7	272.2	700.0
District 4	8 506	440.5	170.1	19.3	50.0
Independence town (pt.)	1 142	4.0	1.6	285.5	713.8
District 5	10 228	122.3	47.2	83.6	216.7
Hammond city (pt.)	1 660	2.8	1.1	592.9	1 509.1
Natalbany CDP	1 289	11.5	4.4	112.1	293.0
Tickfaw village	565	3.9	1.5	144.9	376.7
District 6	8 622	23.9	9.2	360.8	937.2
Hammond city (pt.)	5 516	5.9	2.3	934.9	2 398.3
District 7	9 708	27.0	10.4	359.6	933.5
Hammond city (pt.)	7 529	10.3	4.0	731.0	1 882.3
Ponchatoula city (pt.)	31	.2	1	155.0	310.0
District 8	7 284	208.3	80.4	35.0	90.6
Hammond city (pt.)	174	7.3	2.8	23.8	62.1
District 9	7 443	288.4	111.4	25.8	66.8
Ponchatoula city (pt.)	1 235	2.6	1.0	475.0	1 235.0
District 10	12 807	152.0	58.7	84.3	218.2
Hammond city (pt.)	992	2.9	1.1	342.1	901.8
Ponchatoula city (pt.)	4 159	6.2	2.4	670.8	1 732.9
Tensas Parish	7 103	1 560.6	602.5	4.6	11.8
District 1	764	516.8	199.5	1.5	3.8
Newellton town (pt.)	112	.1	1	1 120.0	1 120.0
District 2	1 052	1.0	.4	1 052.0	2 630.0
Newellton town (pt.)	1 052	1.0	.4	1 052.0	2 630.0
District 3	1 419	314.7	121.5	4.5	11 7
Newellton town (pt.)	412	7	.3	588.6	1 373.3
District 4	1 064	361.3	139.5	2.9	7.6
St. Joseph town (pt.)	508	1.1	.4	461.8	1 270.0
District 5	1 009	1.2	.5	840.8	2 018.0
St. Joseph town (pt.)	1 009	1.2	.5	840.8	2 018.0
District 6	847	364.0	140.5	2.3	6.0
Waterproof town (pt.)	142	.2	1	710 0	1 420.0
District 7	948	1.6	.6	592.5	1 580.0
Waterproof town (pt.)	938	1.6	6	586.3	1 563.3
Terrebonne Parish	96 982	3 250.6	1 255.1	29.8	77 3
District A	5 091	6.2	2.4	821.1	2 121.3
Houma city (pt.)	4 585	5 5	2.1	833.6	2 183.3
District B	4 758	2.3	9	2 068.7	5 286 7
Houma city (pt.)	4 758	2 3	9	2 068 7	5 286.7
District C	5 793	3.5	1.3	1 655.1	4 456.2
Houma city (pt.)	5 620	3.1	1.2	1 812.9	4 683.3
District D	6 132	10.2	3.9	601.2	1 572.3
Houma city (pt.)	2 457	1.4	.5	1 755 0	4 914.0
District E	5 697	4.4	1.7	1 294.8	3 351.2
Houma city (pt.)	5 697	4 4	1.7	1 294.8	3 351.2
District F	7 441	143 7	55.5	51.8	134.1
Houma city (pt.)	1 734	7.3	2.8	237.5	619.3
District G	5 825	507.3	195 9	11.5	29.7
Montegut CDP	1 784	11.5	4.5	155.1	396.4
District H	7 584	109.8	42 4	69.1	178.9
Chauvin CDP	3 375	12.0	4.6	281.3	733.7
Dulac CDP (pt.)	-	-	-	-	-
District I	6 800	1 830 4	706.7	3.7	9.6
Dulac CDP (pt.)	3 273	58.3	22.5	56.1	145.5
District J	8 186	130.8	50.5	62.6	162.1
Bayou Cane CDP (pt.)	23	4 4	1.7	5.2	13.5
Houma city (pt.)	5 638	11.2	4.3	503.4	1 311.2
District K	6 012	5.0	1.9	1 202 4	3 164.2
Bayou Cane CDP (pt.)	5 959	4.7	1.8	1 267.9	3 310.6
Houma city (pt.)	6	-	-	-	-
District L	6 465	44.2	17 1	146.3	378 1
Bayou Cane CDP (pt.)	1 853	2.9	1 1	639.0	1 684.5
Gray CDP (pt.)	1 697	8.8	3 4	192.8	499.1
District M	7 607	9.9	3.8	768.4	2 001.8
Bayou Cane CDP (pt.)	7 607	7.1	2.7	1 071.4	2 817.4
District N	7 736	57.3	22.1	135.0	350.0
Gray CDP (pt.)	1 757	7.7	3.0	228.2	585.7
Schriever CDP (pt.)	4 933	34.2	13.2	144.2	373 7
District O	5 855	385.7	148.9	15.2	39.3
Bayou Cane CDP (pt.)	434	.8	.3	542.5	1 446.7
Gray CDP (pt.)	806	13.6	5.3	59.3	152.1
Schriever CDP (pt.)	25	.6	.2	41.7	125.0
Union Parish	20 690	2 273.2	877.7	9.1	23.6
District 1	1 790	4.8	1.9	372.9	942.1
Farmerville town (pt.)	1 790	4.8	1.9	372.9	942.1
District 2	2 138	387.8	149.7	5.5	14.3
Marion village	775	8.3	3.2	93.4	242.2
District 3	2 184	371.5	143.5	5.9	15.2
Spearsville village	132	5.3	2.1	24.9	62.9
Union Parish—Con					
District 4	2 270	290 4	112.1	7 8	20.2
Bernice town (pt.)	658	5.5	2.1	119 6	313 3
District 5	2 526	233.7	90 2	10 8	28 0
Downsville village (pt.)	82	1.3	5	63 1	164 0
Farmerville town (pt.)	-	1	-	-	-
District 6	2 518	369.5	142.7	6 8	17 6
Farmerville town (pt.)	825	3 1	1.2	266.1	687 5
District 7	2 564	169.5	65.5	15 1	39 1
Farmerville town (pt.)	719	6.2	2 4	116.0	299 6
District 8	2 660	312.8	120.8	8.5	22.0
District 9	2 040	133.0	51.4	15 3	39 7
Bernice town (pt.)	885	2.6	1 0	340 4	885.0
Junction City village (pt.)	644	1 9	.8	338 9	805.0
Lillie village	145	5.0	1.9	29.0	76.3
Vermilion Parish	50 055	3 040.3	1 173.9	16.5	42.6
District 1	4 066	121.9	47.0	33.4	86.5
Maurice village	432	4.4	1.7	98.2	254.1
District 2	4 508	306.5	118.4	14.7	38.1
Gueydan town (pt.)	-	-	-	-	-
District 3	3 731	38.3	14.8	97.4	252.1
Delcambre town (pt.)	701	.7	.3	1 001.4	2 336.7
Erath town (pt.)	1 332	1.1	.4	1 210.9	3 330.0
District 4	3 164	4.9	1.9	645.7	1 665.3
Abbeville city (pt.)	2 865	1.6	.6	1 790.6	4 775.0
District 5	3 272	5.7	2.2	574.0	1 487.3
Abbeville city (pt.)	2 134	2.2	.8	970.0	2 667.5
District 6	3 888	66.5	25.7	58.5	151.3
Abbeville city (pt.)	910	2.7	1.0	337.0	910.0
Erath town (pt.)	193	1.3	.5	148.5	386.0
District 7	3 392	1.8	.7	1 884 4	4 845.7
Abbeville city (pt.)	3 392	1.8	7	1 884 4	4 845 7
District 8	4 070	213.6	82.5	19 1	49.3
Delcambre town (pt.)	737	.5	2	1 474.0	3 685.0
Erath town (pt.)	903	1.5	.6	602 0	1 505.0
District 9	3 525	242.6	93.7	14.5	37.6
Abbeville city (pt.)	481	1 8	7	267.2	687.1
District 10	3 289	100.4	38.8	32.8	84.8
Kaplan city (pt.)	2 223	2.1	.8	1 058.6	2 778.8
District 11	3 248	60.9	23.5	53.3	138.2
Abbeville city (pt.)	1 405	2.7	1.0	520 4	1 405.0
Kaplan city (pt.)	53	.6	.2	88.3	265.0
District 12	3 014	31.8	12.3	94.8	245.0
Kaplan city (pt.)	2 259	1.8	7	1 255.0	3 227.1
District 13	3 549	1 301.9	502 7	2.7	7.1
District 14	3 339	543 4	209.8	6 1	15.9
Gueydan town (pt.)	1 611	2.1	.8	767.1	2 013.8
Vernon Parish	61 961	3 440.8	1 328.5	18.0	46.6
District 1	2 606	243.6	94 1	10.7	27.7
Hornbeck town	427	3.0	1.1	142.3	388.2
District 2	3 634	249.5	96.3	14.6	37.7
Anacoco village	823	8.0	3.1	102.9	265.5
District 3	2 963	602.4	232.6	4.9	12.7
District 4	24 360	251.8	97.2	96.7	250.6
Fort Polk South CDP	10 911	16.0	6.2	681 9	1 759.8
District 5	2 947	838.5	323.7	3.5	9.1
District 6	3 108	790.0	305.0	3.9	10.2
Simpson village	536	13.2	5.1	40.6	105 1
District 7	3 830	163.9	63.3	23.4	60.5
De Ridder city (pt.)	357	4	1	892 5	3 570.0
Rosepine town	1 135	5 8	2 2	195 7	515 9
District 8	3 587	49.6	19 1	72 3	187.8
Newllano town (pt.)	2 588	1.7	7	1 522 4	3 697 1
District 9	2 690	22.6	8.7	119 0	309.2
Leesville city (pt.)	2 438	5.7	2.2	427 7	1 108.2
Newllano town (pt.)	72	.1	-	720.0	-
District 10	1 734	8.7	3.3	199 3	525.5
Leesville city (pt.)	1 580	1 7	7	929 4	2 257.1
District 11	7 231	74.8	28 9	96.7	250.2
Fort Polk North CDP	3 819	10.3	4.0	370.8	954.8
Leesville city (pt.)	2 601	5.8	2.3	448.4	1 130.9
District 12	3 271	145.5	56.2	22.5	58.2
Leesville city (pt.)	1 019	.8	.3	1 273.8	3 396.7
Washington Parish	43 185	1 734.3	669.6	24.9	64.5
District 1	2 610	4 9	1 9	532.7	1 373.7
Bogalusa city (pt.)	2 401	2.2	.8	1 091.4	3 001.3
District 2	2 474	23.2	8.9	106.6	278.0
Bogalusa city (pt.)	2 397	6.5	2.5	368.8	958.8
District 3	2 688	13.2	5.1	203.6	527.1
Bogalusa city (pt.)	2 216	2 2	.8	1 007.3	2 770.0
District 4	2 901	37.9	14.6	76.5	198.7
Bogalusa city (pt.)	1 684	3.7	1.4	455.1	1 202.9
District 5	3 200	62.3	24.1	51 4	132.8
Bogalusa city (pt.)	1 245	1 3	5	957 7	2 490.0
District 6	2 712	31 4	12 1	86.4	224.1
Bogalusa city (pt.)	2 168	4.7	1 8	461 3	1 204.4
District 7	2 621	15.8	6 1	165 9	429.7
Bogalusa city (pt.)	2 169	3.9	1.5	556.2	1 446.0
District 8	4 832	303.3	117.1	15 9	41.3
Angie village (pt.)	33	.8	.3	41.3	110.0
Varnado village (pt.)	236	2.1	.8	112 4	295.0
District 9	3 050	202.6	78.2	15.1	39.0
Angie village (pt.)	202	3.2	1.2	63.1	168.3
Varnado village (pt.)	-	.1	-	-	-
District 10	5 309	259.0	100.0	20.5	53.1
Franklinton town (pt.)	1 186	5.7	2.2	208.1	539.1
District 11	3 441	268.2	103.6	12.8	33.2
Franklinton town (pt.)	366	1.4	.5	261.4	732.0
District 12	1 655	207.0	79.9	8.0	20.7
District 13	2 678	281.8	108.8	9.5	24.6
Franklinton town (pt.)	-	-	-	-	-

REFERENCE 32

~~88638~~

DELTA SHIPYARD

COVERAGE

STATE	COUNTY	STATE NAME	COUNTY NAME
22	57	Louisiana	Lafourche Par
22	109	Louisiana	Terrebonne Par

CENTER POINT AT STATE : 22 Louisiana
COUNTY : 109 Terrebonne Par

REGION OF THE COUNTRY

Zipcode found: 70361 at a distance of 3.3 Km

STATE	CITY NAME	FIPSCODE	LATITUDE	LONGITUDE
LA	HOUMA	22109	29.5967	90.7167

CENSUS DATA

Delta Shipyard
LATITUDE 29:34: 9 LONGITUDE 90:42:17 1990 POPULATION

SECTOR

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	TOTALS
S 1	0	0	3593	13252	17001	6642	40488
RING TOTALS	0	0	3593	13252	17001	6642	40488

STAR STATION

WBAN NUMBER	STATION NAME	LATITUDE	LONGITUDE	PERIOD OF RECORD	DISTANCE (km)
12916	NEW ORLEANS/MOISANT LA	29.9833	90.2500	1960-1964	63.6
12958	NEW ORLEANS/CALLENDER LA	29.8167	90.0167	1967-1971	71.9
13970	BATON ROUGE/RYAN LA	30.5333	91.1500	1975-1979	115.4
13976	LAFAYETTE LA	30.2000	91.9833	1954-1958	141.7
93919	MCCOMB/PIKE CO MS	31.2500	90.4667	1949-1954	188.1
13820	BILOXI/KEESLER MS	30.4167	88.9167	1960-1964	196.1
03937	LAKE CHARLES LA	30.1167	93.2167	1966-1970	249.6

REFERENCE 33

~~88639~~

U.S. DEPARTMENT OF COMMERCE
C. R. Smith, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

JUNE 1968

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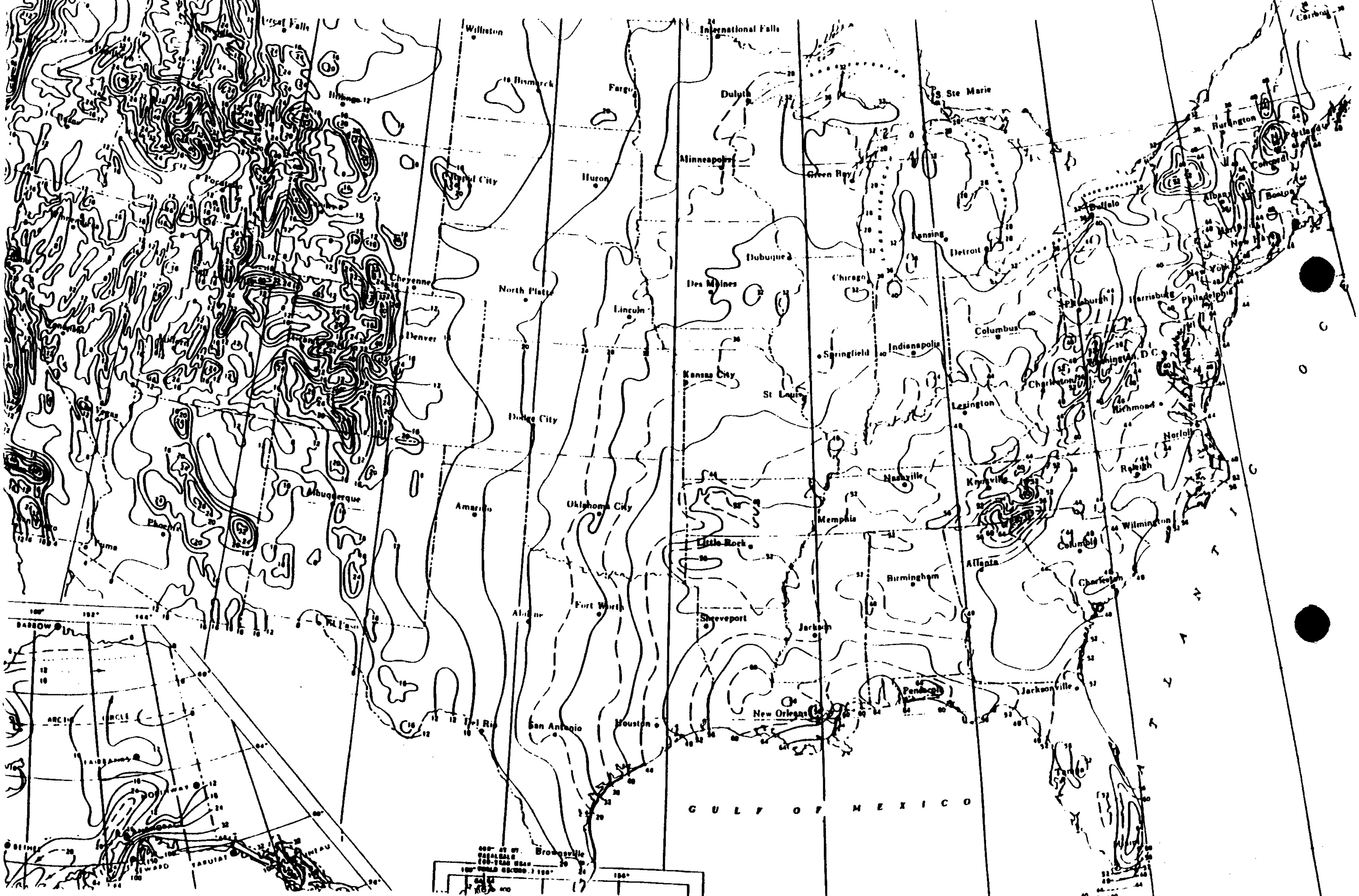
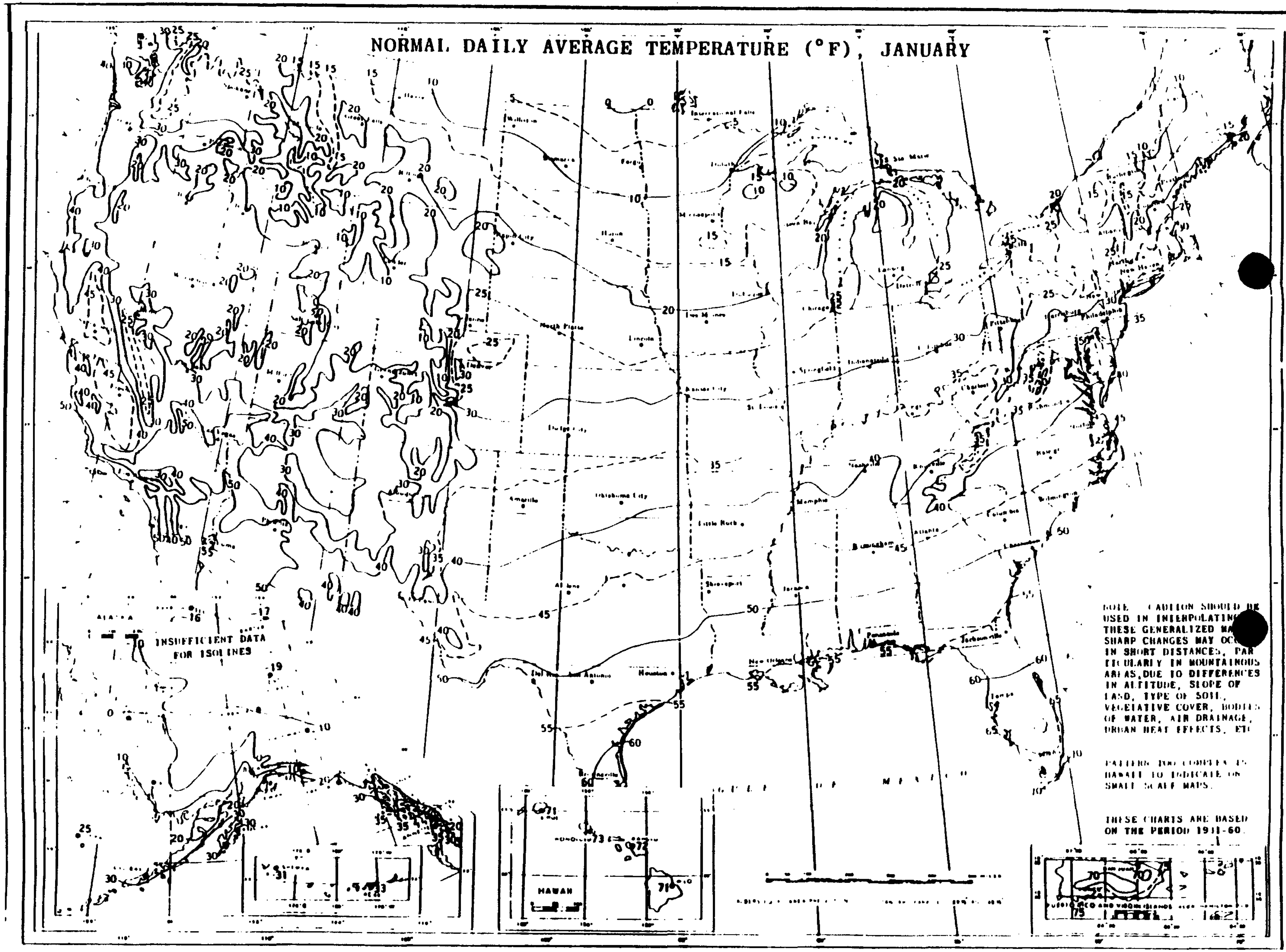
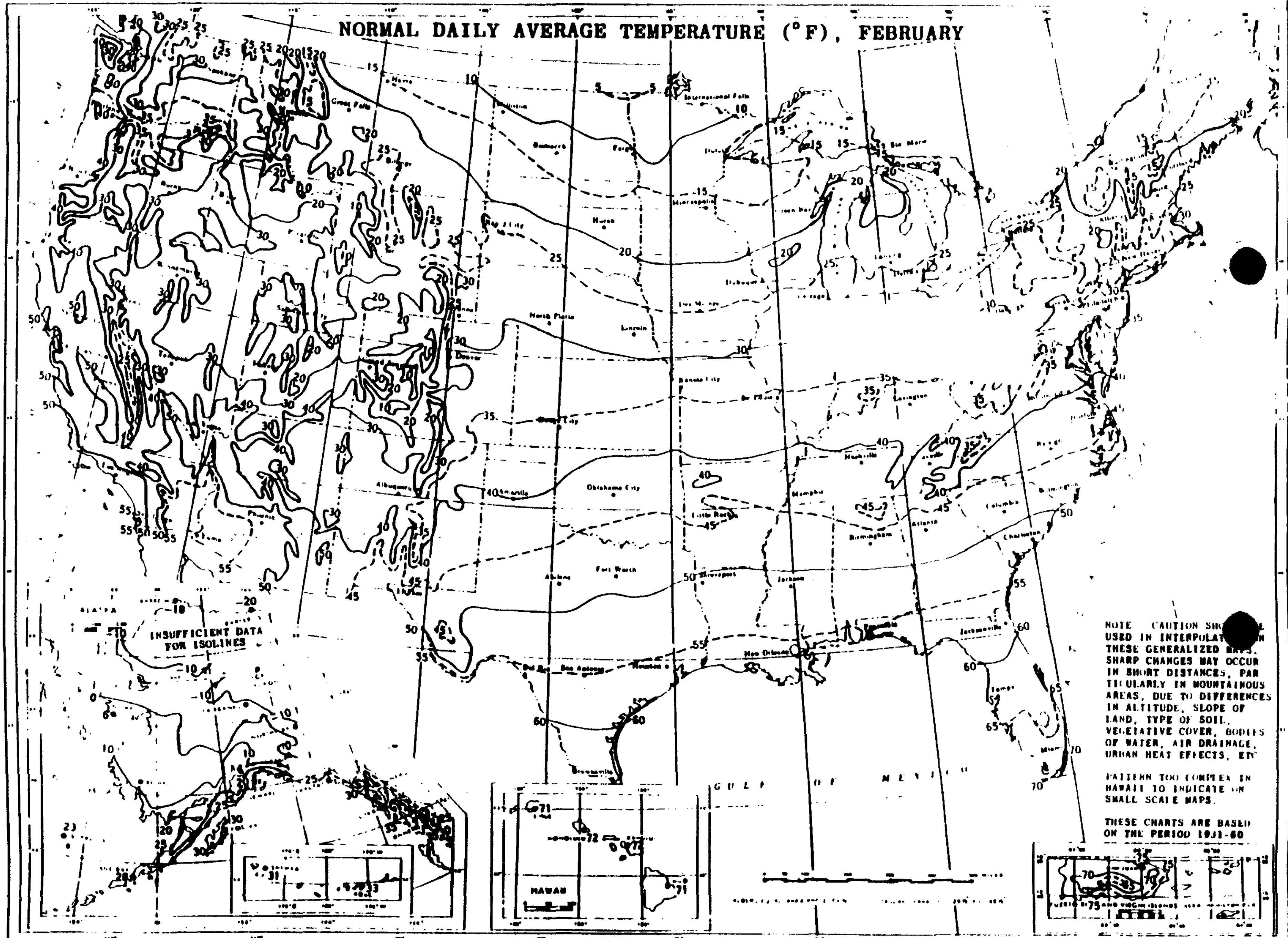
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

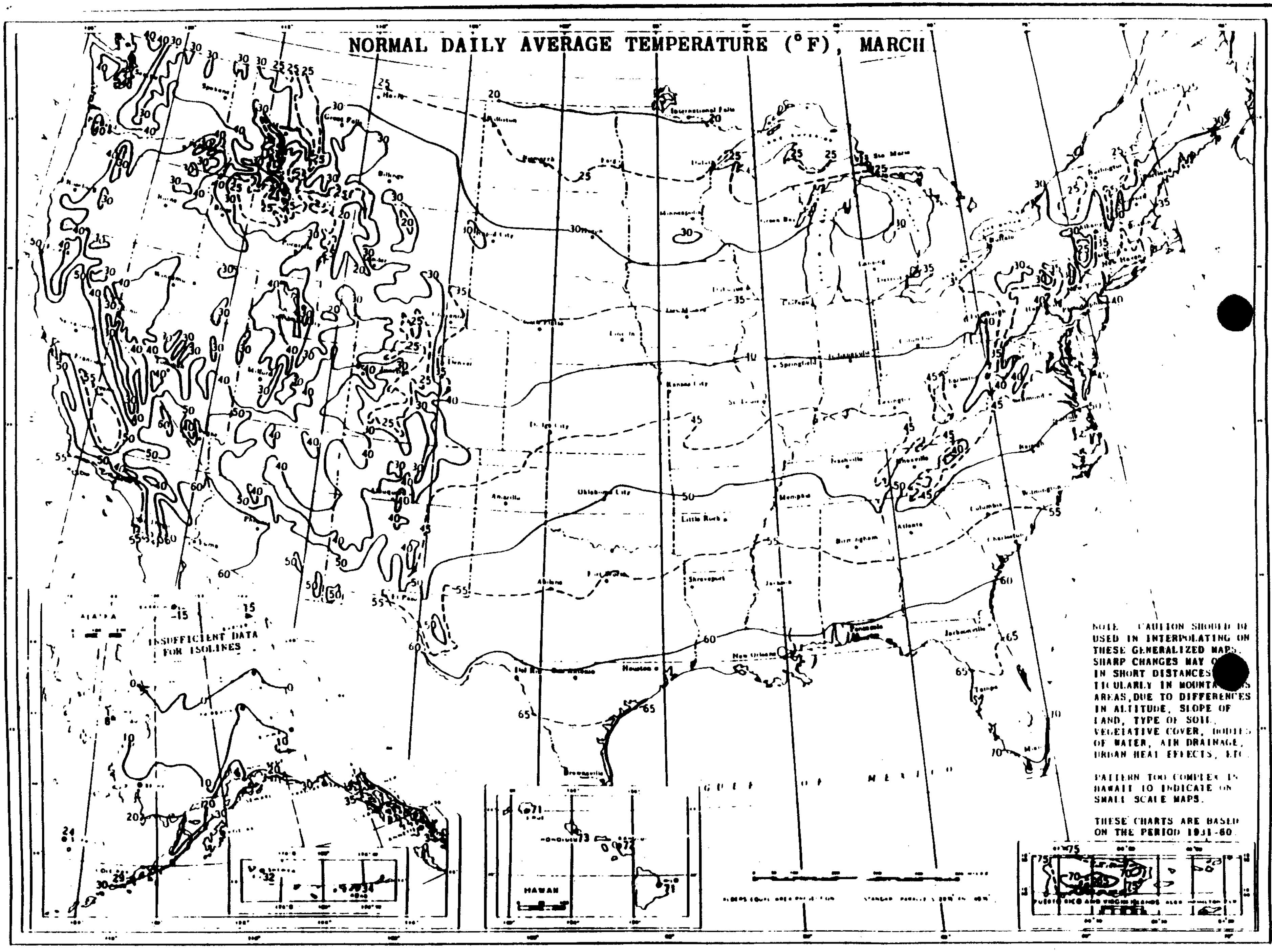
1983

TOTAL ANNUAL PRECIPITATION

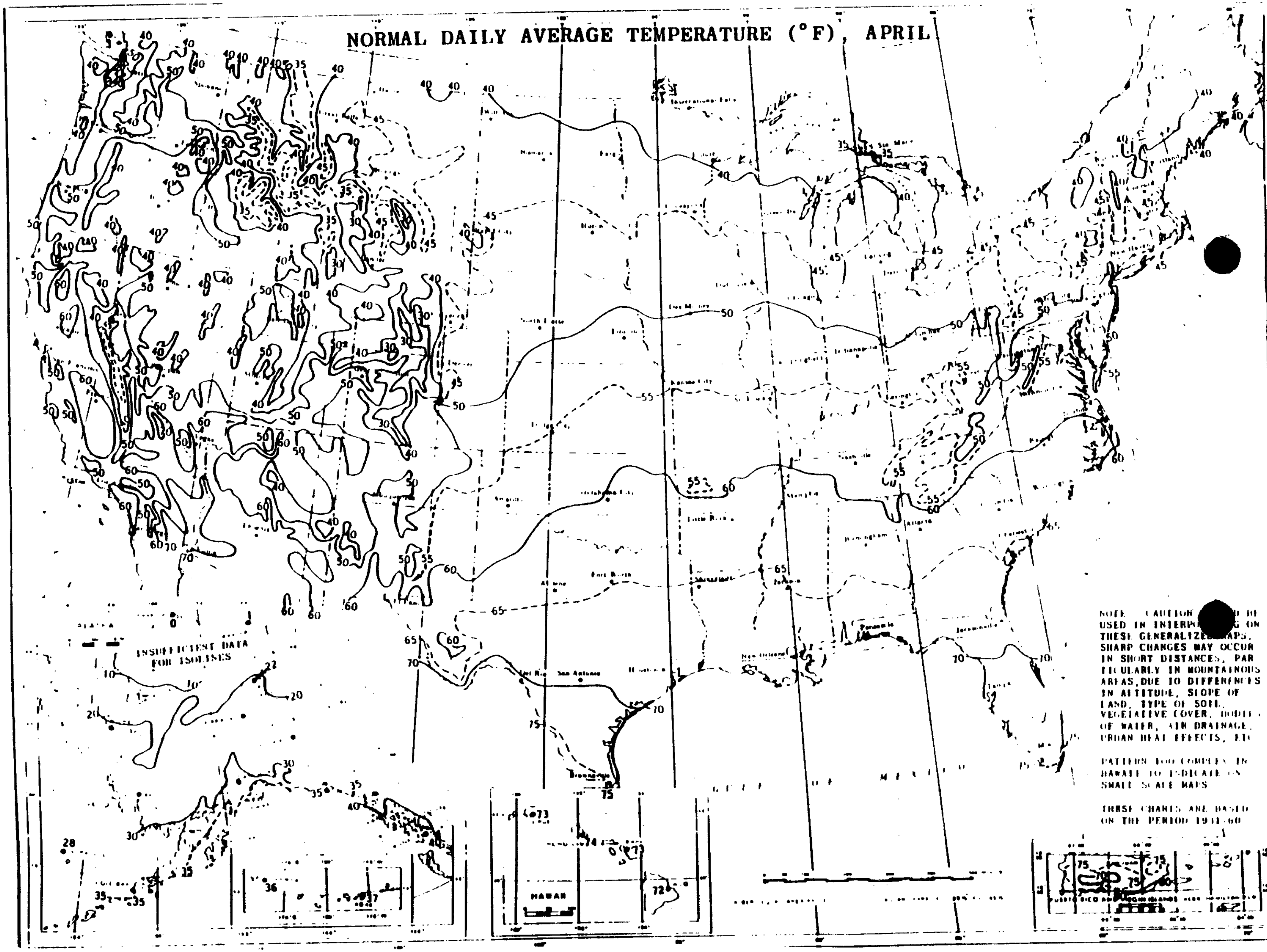



NORMAL DAILY AVERAGE TEMPERATURE (°F), JANUARY
ALASKA
INSUFFICIENT DATA FOR ISOLINES
HAWAII
NOTE - CAUTION SHOULD
USED IN INTERPOLATING
THESE GENERALIZED MA
SHARP CHANGES MAY OC
IN SHORT DISTANCES, PAR
TICULARLY IN MOUNTAINOUS
AREAS, DUE TO DIFFERENCES
IN ALTITUDE, SLOPE OF
LAND, TYPE OF SOIL,
VEGETATIVE COVER, BODIES
OF WATER, AIR DRAINAGE,
URBAN HEAT EFFECTS, ETC
PATTERNS TOO COMPLEX IN
HAWAII TO INDICATE ON
SMALL SCALE MAPS.
THESE CHARTS ARE BASED
ON THE PERIOD 1931-60.

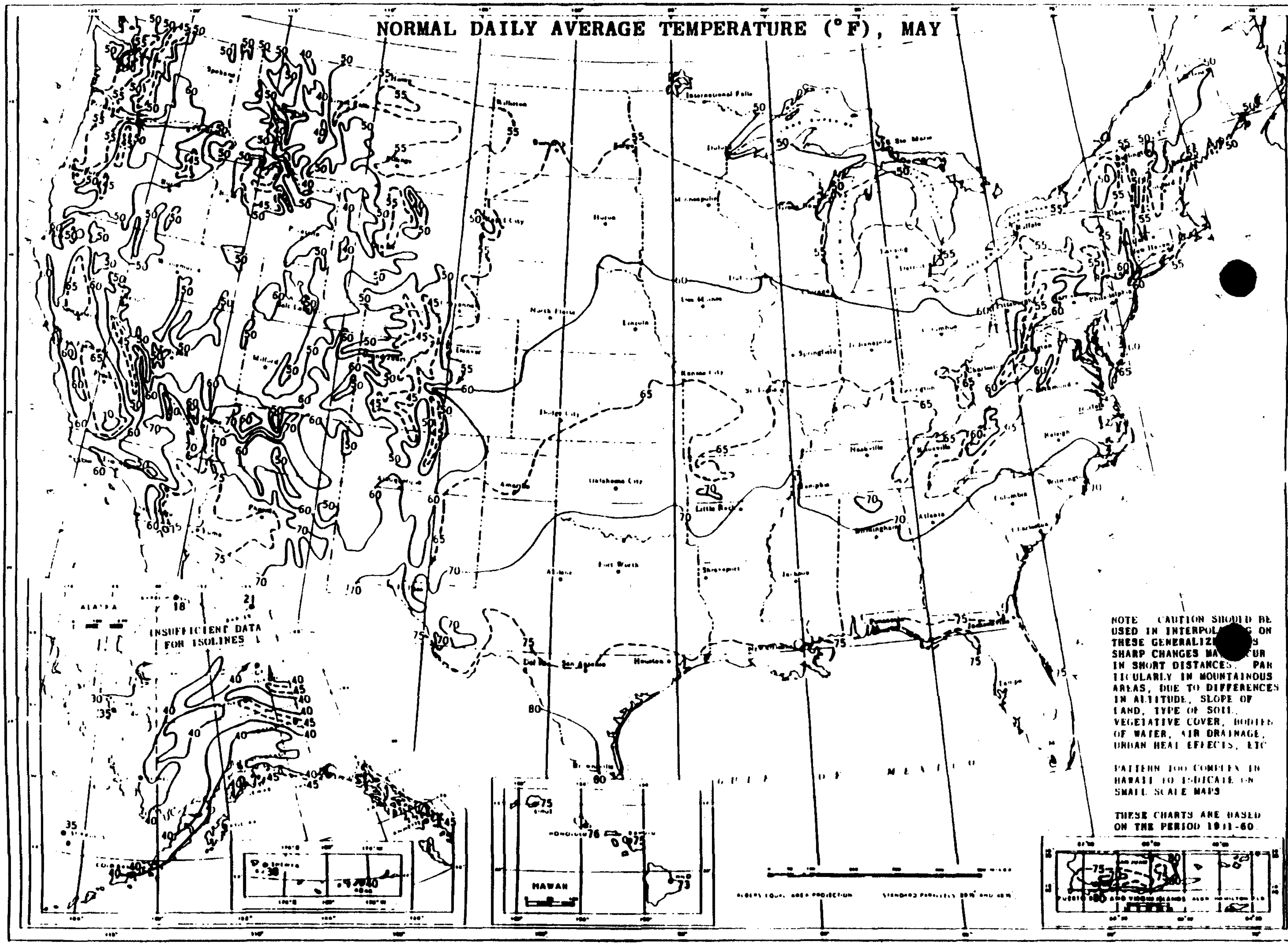

NORMAL DAILY AVERAGE TEMPERATURE (°F), FEBRUARY
INSUFFICIENT DATA FOR ISOLINES
HAWAII
NOTE CAUTION SHO USED IN INTERPOLAT N THESE GENERALIZED MAPS. SHARP CHANGES MAY OCCUR IN SHORT DISTANCES, PARTICULARLY IN MOUNTAINOUS AREAS, DUE TO DIFFERENCES IN ALTITUDE, SLOPE OF LAND, TYPE OF SOIL, VEGETATIVE COVER, BODIES OF WATER, AIR DRAINAGE, URBAN HEAT EFFECTS, ETC.
PATTERN TOO COMPLEX IN HAWAII TO INDICATE ON SMALL SCALE MAPS.
THESE CHARTS ARE BASED ON THE PERIOD 1931-60

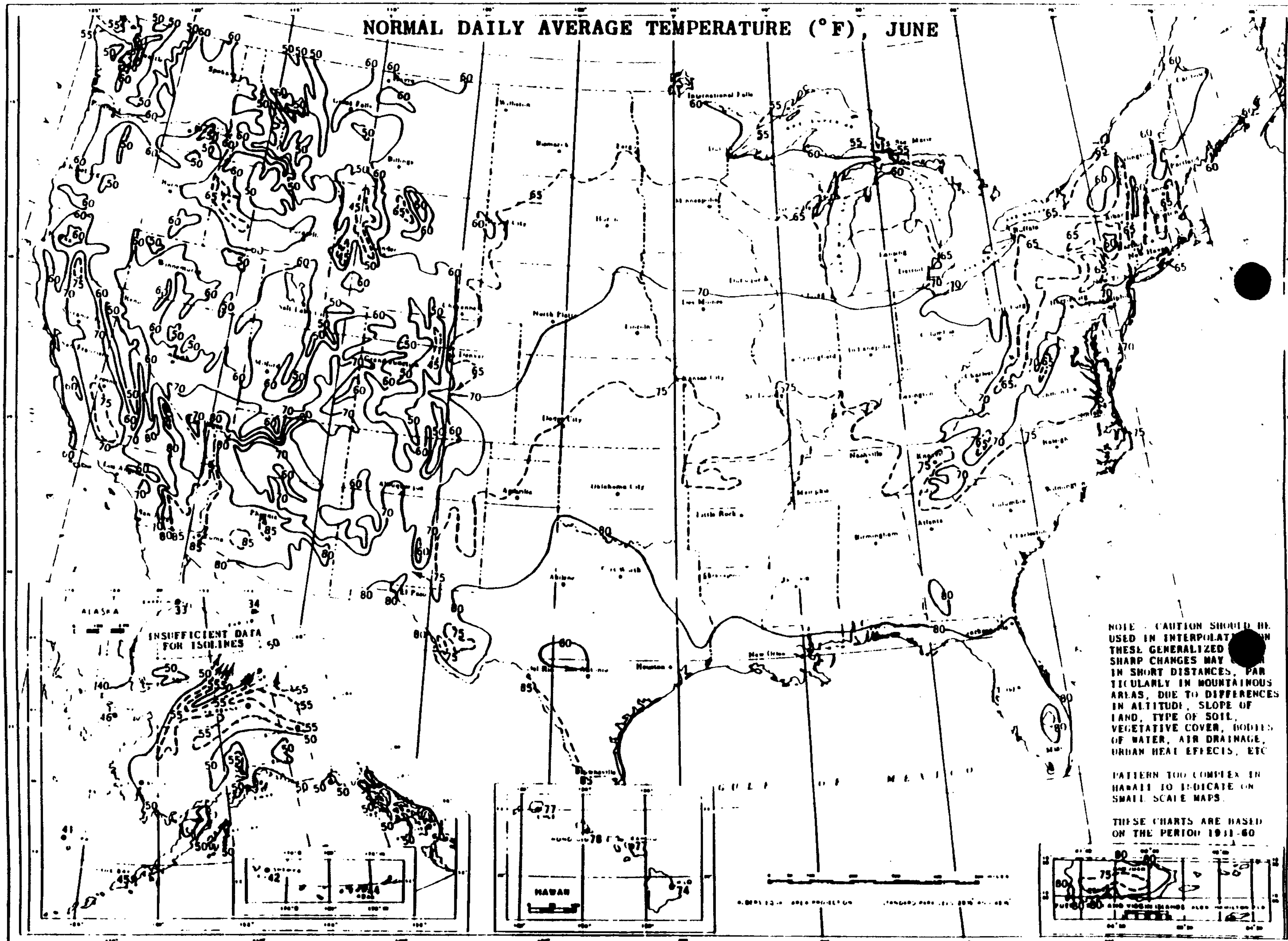

NORMAL DAILY AVERAGE TEMPERATURE (°F), MARCH
INSUFFICIENT DATA FOR ISOLINES
HAWAII
GULF OF MEXICO
NOTE CAUTION SHOULD BE USED IN INTERPOLATING ON THESE GENERALIZED MAPS. SHARP CHANGES MAY O
IN SHORT DISTANCES
TICULARLY IN MOUNTA
AREAS, DUE TO DIFFERENCES IN ALTITUDE, SLOPE OF LAND, TYPE OF SOIL, VEGETATIVE COVER, BODIES OF WATER, AIR DRAINAGE, URBAN HEAT EFFECTS, ETC.
PATTERN TOO COMPLEX IN HAWAII TO INDICATE ON SMALL SCALE MAPS.
THESE CHARTS ARE BASED ON THE PERIOD 1931-60.

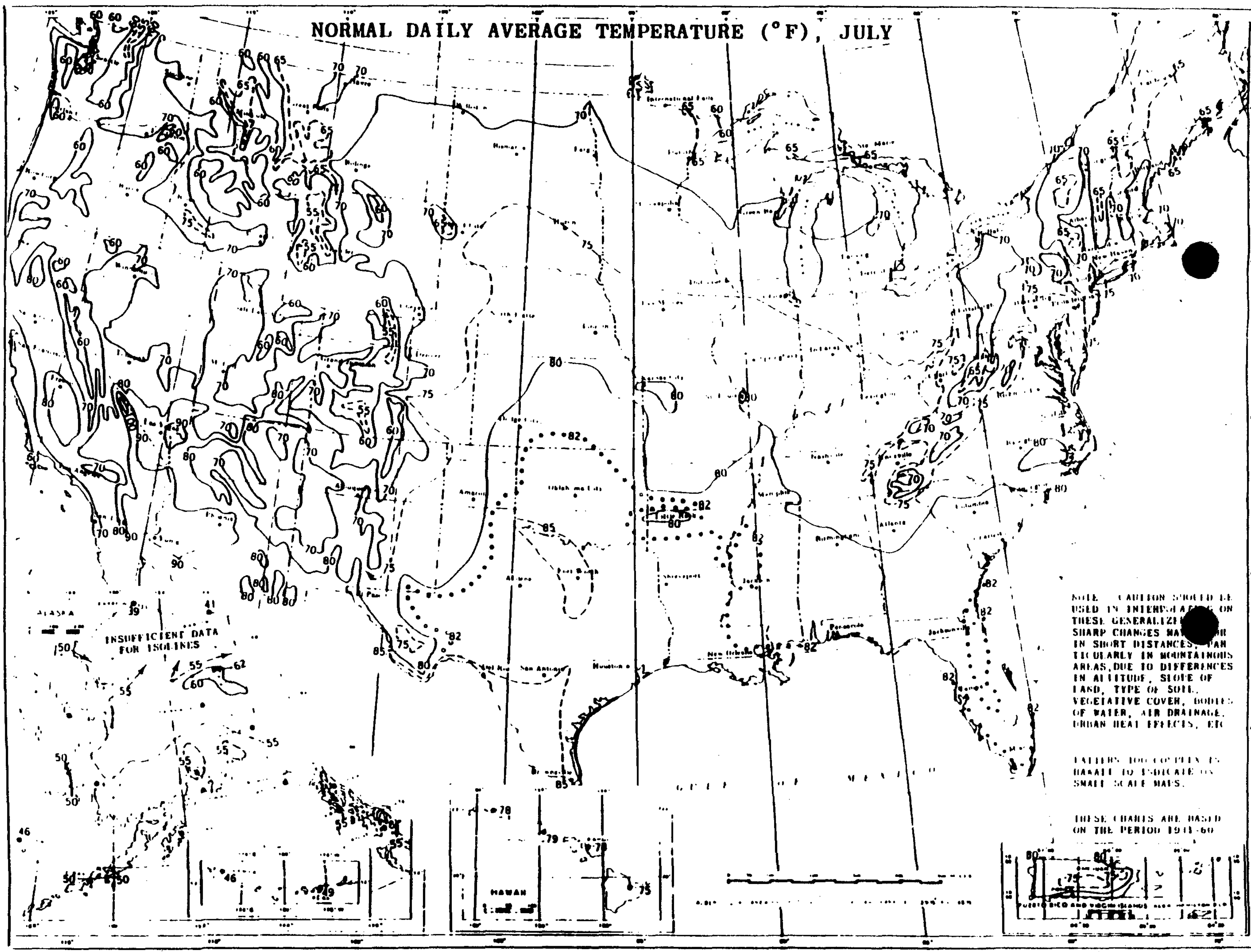
NORMAL DAILY AVERAGE TEMPERATURE (°F), APRIL

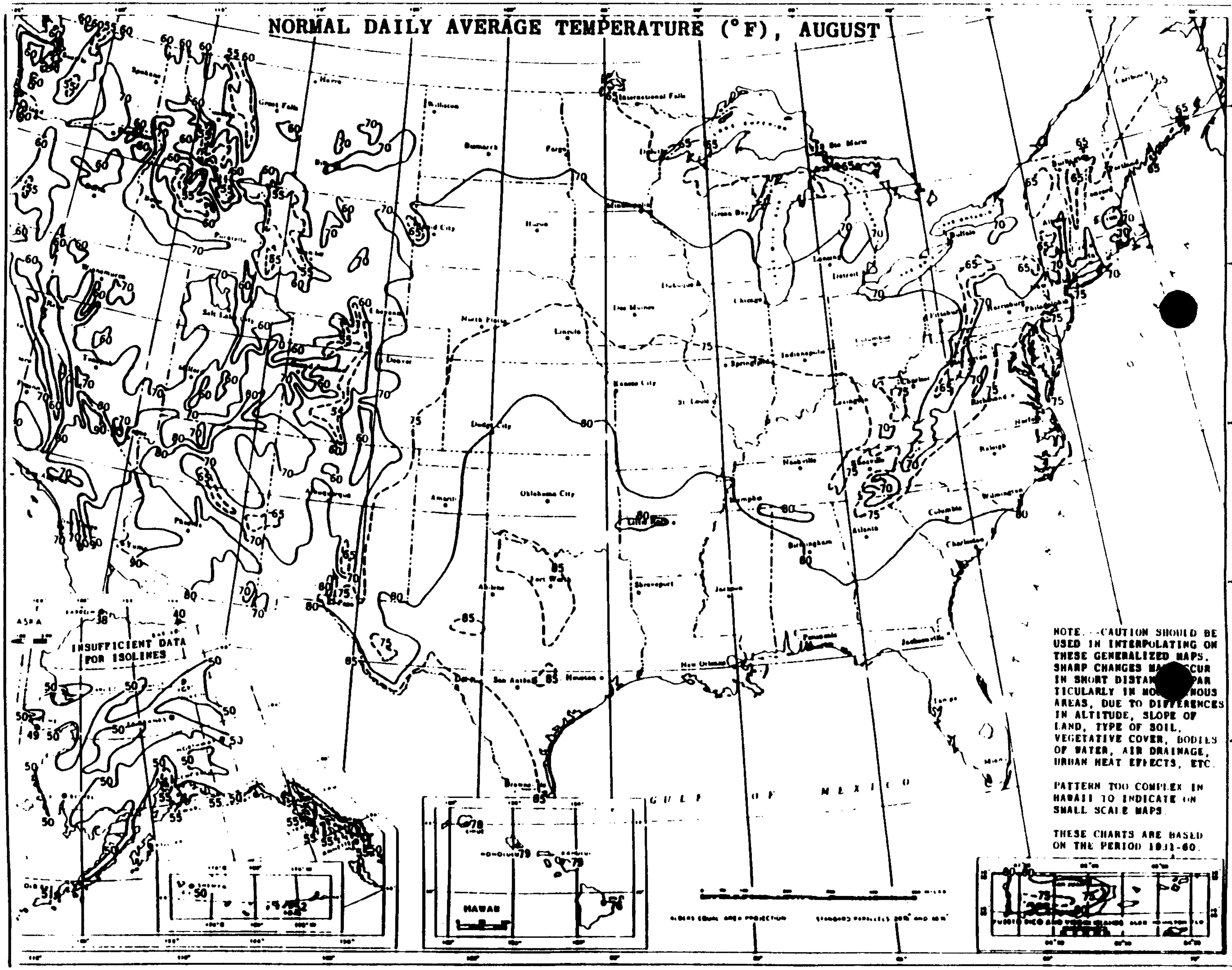


NORMAL DAILY AVERAGE TEMPERATURE (°F), MAY

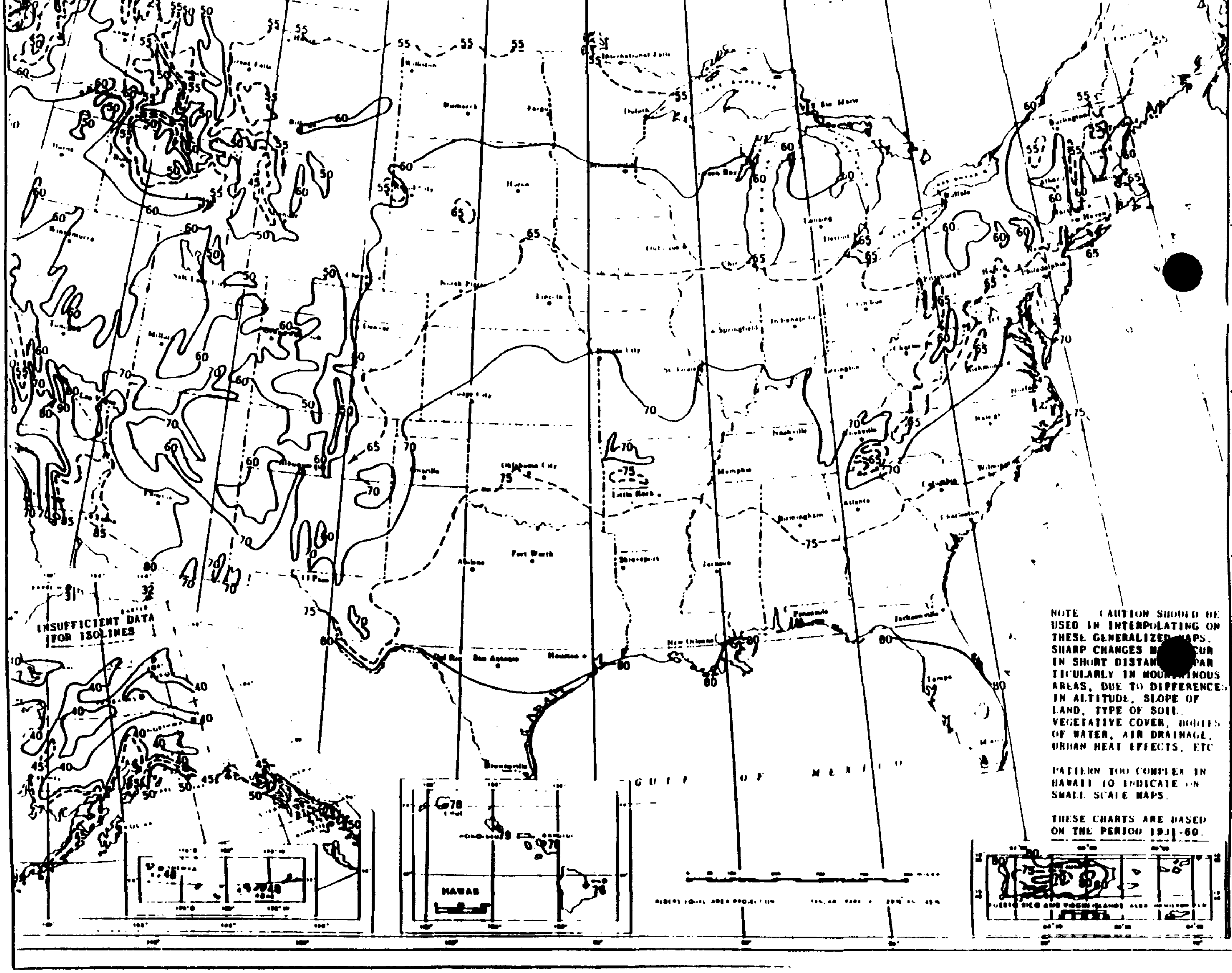



NORMAL DAILY AVERAGE TEMPERATURE (°F), JUNE
ALASKA
INSUFFICIENT DATA FOR ISOLINES
HAWAII
International Falls
NOTE - CAUTION SHOULD BE USED IN INTERPOLAT ON THESE GENERALIZED SHARP CHANGES MAY IN SHORT DISTANCES, PARTICULARLY IN MOUNTAINOUS AREAS, DUE TO DIFFERENCES IN ALTITUDE, SLOPE OF LAND, TYPE OF SOIL, VEGETATIVE COVER, BODIES OF WATER, AIR DRAINAGE, URBAN HEAT EFFECTS, ETC
PATTERN TOO COMPLEX IN HAWAII TO INDICATE ON SMALL SCALE MAPS.
THESE CHARTS ARE BASED ON THE PERIOD 1931-60

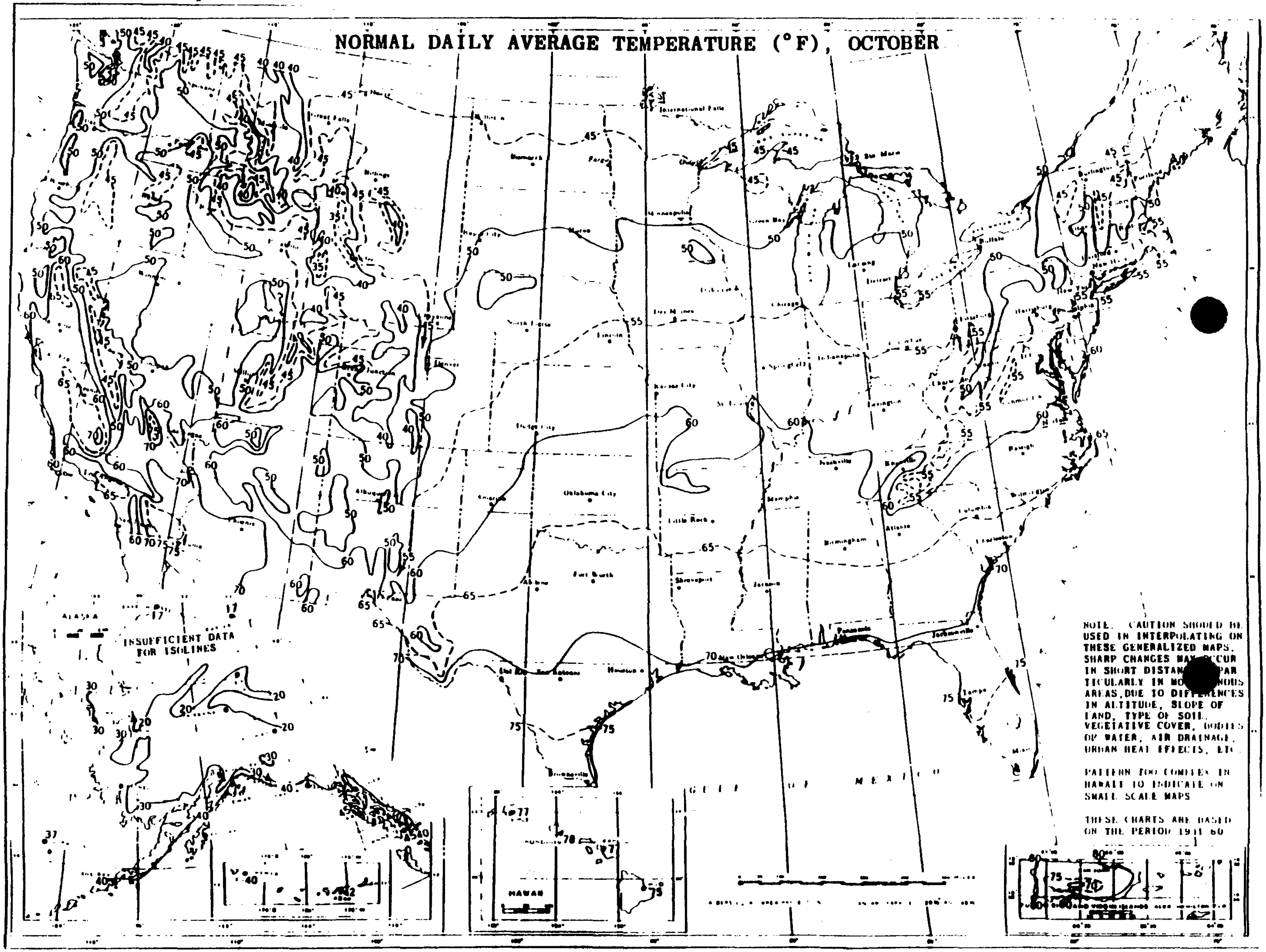

NORMAL DAILY AVERAGE TEMPERATURE (°F), JULY
INSUFFICIENT DATA FOR ISOLINES
HAWAII
IN SHORT DISTANCES
TICULARLY IN MOUNTAINOUS
AREAS, DUE TO DIFFERENCES
VEGETATIVE COVER,
OF WATER, AIR DRAINAGE,
SMALL SCALE MAPS.
ON THE PERIOD


NORMAL DAILY AVERAGE TEMPERATURE (°F), AUGUST
INSUFFICIENT DATA FOR ISOLINES
NOTE.--CAUTION SHOULD BE USED IN INTERPOLATING ON THESE GENERALIZED MAPS. SHARP CHANGES MAY OCCUR IN SHORT DISTANCES, PARTICULARLY IN MOUNTAINOUS AREAS, DUE TO DIFFERENCES IN ALTITUDE, SLOPE OF LAND, TYPE OF SOIL, VEGETATIVE COVER, BODIES OF WATER, AIR DRAINAGE, URBAN HEAT EFFECTS, ETC.
PATTERN TOO COMPLEX IN HAWAII TO INDICATE ON SMALL SCALE MAPS.
THESE CHARTS ARE BASED ON THE PERIOD 1931-60.
GULF OF MEXICO
HAWAII

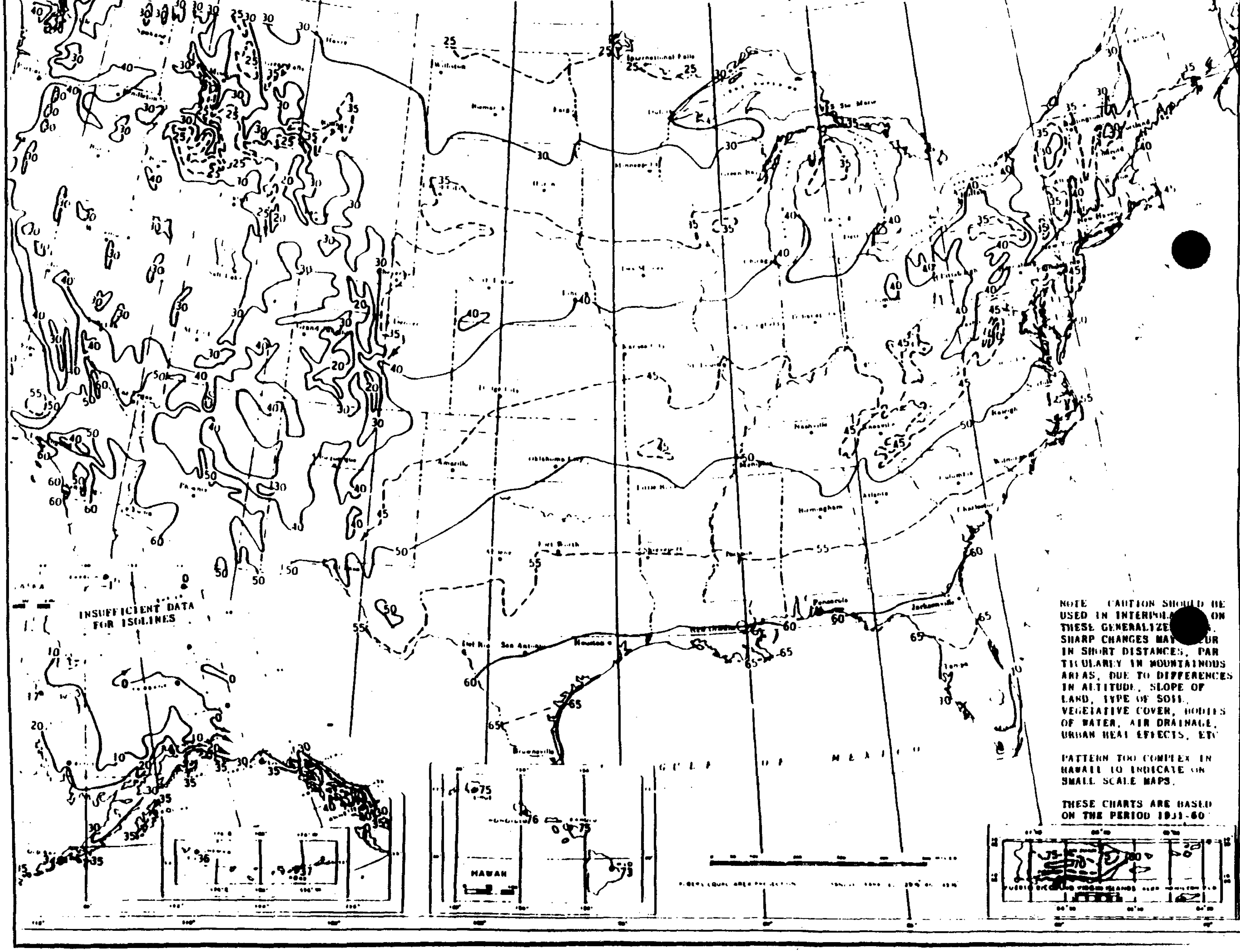
NORMAL DAILY AVERAGE TEMPERATURE (°F), SEPTEMBER



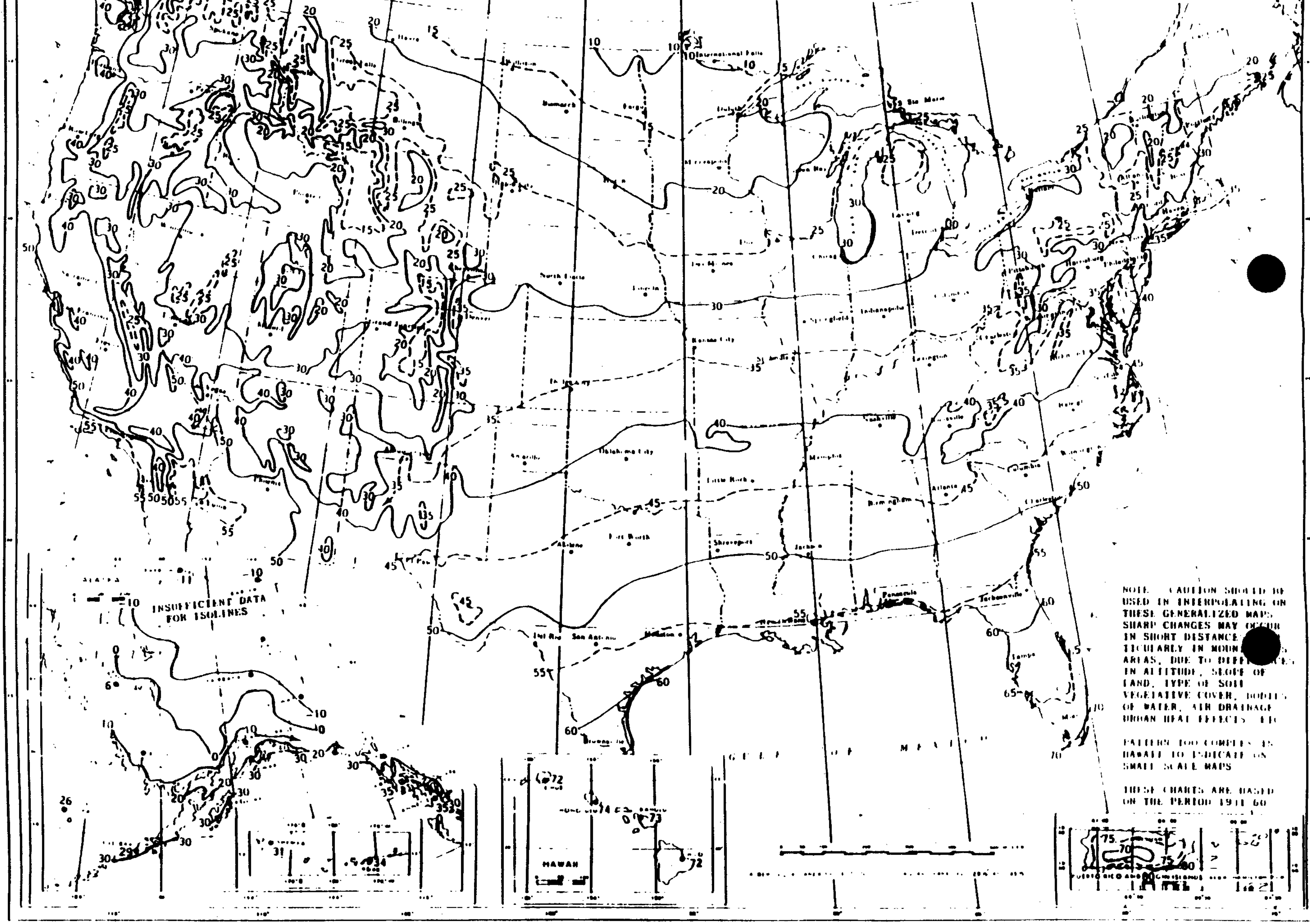
NORMAL DAILY AVERAGE TEMPERATURE (°F), OCTOBER

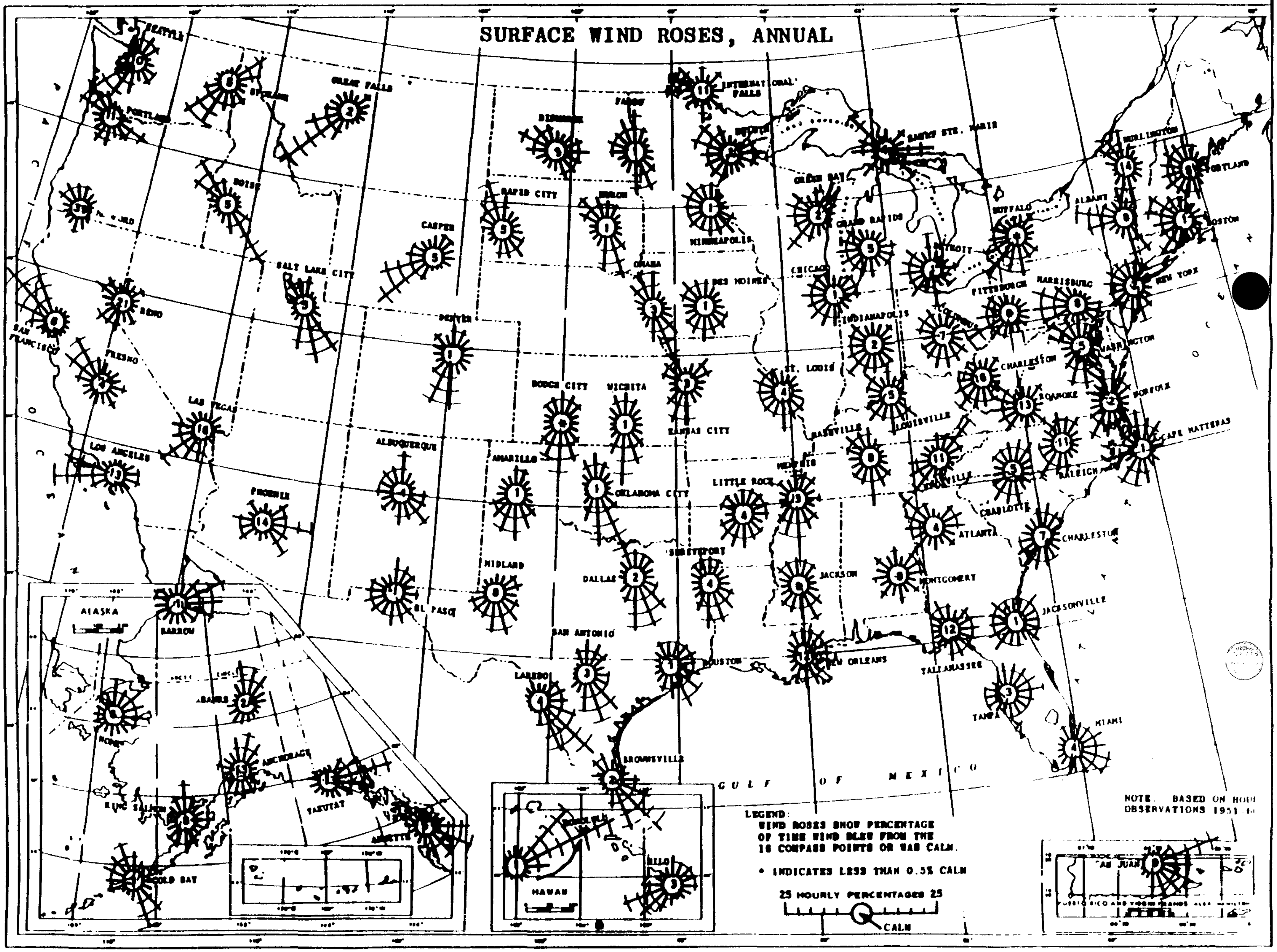


NORMAL DAILY AVERAGE TEMPERATURE (°F), NOVEMBER



NORMAL DAILY AVERAGE TEMPERATURE (°F), DECEMBER




SURFACE WIND ROSES, ANNUAL
SEATTLE
SPOKANE
GREAT FALLS
PORTLAND
BOISE
CASPER
SALT LAKE CITY
RENO
SAN FRANCISCO
FRESNO
LAS VEGAS
LOS ANGELES
PHOENIX
DENVER
ALBUQUERQUE
EL PASO
MIDLAND
RAPID CITY
HURON
FARGO
INTERNATIONAL FALLS
DULUTH
MINNEAPOLIS
OMAHA
DES MOINES
DODGE CITY
WICHITA
KANSAS CITY
AMARILLO
OKLAHOMA CITY
DALLAS
SAN ANTONIO
LAREDO
HOUSTON
BROWNSVILLE
SHREVEPORT
LITTLE ROCK
MEMPHIS
JACKSON
NEW ORLEANS
ST. LOUIS
CHICAGO
GREEN BAY
GRAND RAPIDS
SAULT STE. MARIE
DETROIT
INDIANAPOLIS
LOUISVILLE
NASHVILLE
ATLANTA
MONTGOMERY
TALLAHASSEE
TAMPA
MIAMI
JACKSONVILLE
CHARLESTON
CHARLOTTE
RALEIGH
CAPE HATTERAS
NORFOLK
ROANOKE
CHARLESTON
WASHINGTON
PITTSBURGH
HARRISBURG
BUFFALO
ALBANY
BURLINGTON
PORTLAND
BOSTON
NEW YORK
GULF OF MEXICO
ALASKA
BARROW
NOME
ANCHORAGE
YAKUTAT
KING SALMON
COLD BAY
HAWAII
HILO
SAN JUAN
PUERTO RICO AND VIRGIN ISLANDS
NOTE. BASED ON HOURLY OBSERVATIONS 1951-60
LEGEND:
WIND ROSES SHOW PERCENTAGE OF TIME WIND BLEW FROM THE 16 COMPASS POINTS OR WAS CALM.
* INDICATES LESS THAN 0.5% CALM
25 HOURLY PERCENTAGES 25
CALM